The Alberta School

A Magazine for Classroom Service

Vol. 1 NOVEMBER 1926 No. 3

PUBLISHED MONTHLY

INSTITUTE OF APPLIED ART, LTD.

Educational Publishers

EDMONTON ALBERTA

The Alberta School

A Magazine for Classroom Service

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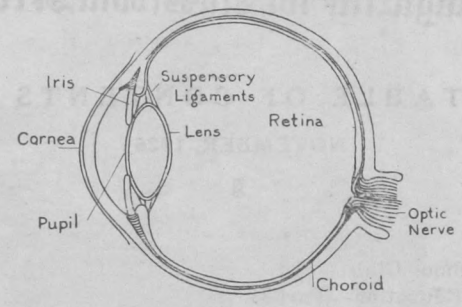
OUR ADVERTISERS

OUR EYES



In our last talk, we likened the human eye to a camera. To get a better understanding of the parts of the eye and their functions, we are showing you this month a small diagram of an eye in vertical section.

The structure of the eyeball consists of three coats:—

(1) The outer coat is a hard, tough substance called the **sclerotic** and forms the framework of the eye to which the muscles and other parts are attached. It is white except in front, where it becomes colorless and transparent forming what is known as the **cornea.** The latter is really the "window of the eye" for through it light enters. The cornea is hard and tough and has a highly polished surface which bulges out slightly from the surface of the eyeball.

(2) The next inner coat is called the **choroid.** It is a dark-colored delicate tissue which contains the blood vessels. In the front it folds back on itself and becomes thicker forming the **ciliary muscles.** The colored **iris** is that part of the choroid which can be seen, and in the center of which is the opening called the pupil.

(3) The innermost coat is called the **retina.** It is really a prolongation of the optic nerve—an extension of the brain matter within the eye. The optic nerve passes through an opening in the socket, enters the eye and forms the retina which spreads out like a cup lining the whole interior of the eye as far front as the ciliary body.

The **acqueous humor** (a thin clear liquid), fills the **anterior chamber** which is the space between the cornea and lens.

The lens is a semi-solid elastic crystal-clear substance enclosed in a transparent envelope and held in place by the **suspensory ligament.**

The large space behind the lens is called the **"posterior chamber".** It is filled with a transparent jelly-like substance called the **vitreous humor.**

Our next lesson will be on the **muscles of the eye.**

These articles are published for the sake of Eyesight Conservation by the following optometrists who restrict their work entirely to the correction of Visual Defects:—

Edmonton Optical Co. ..... **10153 Jasper Ave.**
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EDITORIAL

WANTED—A NEW EDUCATIONAL DYNAMIC

No doubt it always has been, and always will be, a Sisyphean task to build and instal a system of public education that will give even a fair measure of general satisfaction. During this post-war period, however, there has been more than the usual amount of complaint about our schools and their ways: their cost is mounting unconscionably; their methods of instruction are ineffective; and the learning they dispense is antiquated. As a temporary measure of relief from the ever-increasing burden of cost, the "teacher load" has been increased in our city schools to fifty pupils; but even this proceeding calls forth fresh cries of protest from parents and teachers alike.

Nevertheless, proportionately more pupils are flocking to our high schools than ever before. Secondary education is at a high premium. No matter what it may cost, the public will have it. In fact, this present-day vogue of high school education is viewed by many competent observers as nothing short of a craze. This situation surely challenges attention, and invites analysis.

It is a very superficial explanation of this phenomenon to say that the public is at last coming to realize the paramount importance of secondary education. The mere fact that many people want a thing is no guarantee either that they know why they want it, or appreciate its value. Despite the well-meant efforts of our educationists and post-prandial orators, who repeat, almost "ad nauseam", this cliche about the value of education, its still doubtful whether "das liebe Publicum" yet knows what it values in secondary education, or why. Nor is there general agreement on these questions even amongst educationists themselves. Still less discernment, therefore, can be expected of the laity. Moreover, even if the general public were enlightened on this matter, it would be extravagant to suppose that such a public would lay on itself a well-nigh intolerable tax burden for the purpose of promoting an abstract social ideal.

A far more likely explanation is to be found in the patent fact that secondary education confers social status: it is the hall-mark of a preferred class. Accordingly, every parent desires his children to be invested with the reputability of the higher learning: those of the "lower class" that their children may climb to the "upper class" through having "a better start in life" than they had; those of the "upper class", that their children may conform—in the externals, at least—to the requirements of that class, and maintain the status already acquired by their parents. In neither class of pupils is there likely to be any flair for in-

tellectual adventure. They do not rush to the classroom with feverish intrepidity, bound on a quest of high emprise; they are sent there—at a snail's pace—to receive "culture", and social status.

One may satisfy himself on this point by observing the morale of an average high-school class. There he will find a group of forty or more students of which, in the first place, about twenty per cent. can profit to no worth-while extent by the instruction offered, because of their lack of the necessary mental capacity. Then another forty per cent. sit there in a state of indolent passivity, having no active interest in classroom work. They are there to be amused or entertained. Upon these the teacher is expected the exhaust the powers of his personality. He must inveigle, cajole, or coerce them into some semblance of activity. A further twenty-five per cent. have superior ability, and despite their lack of interest, seem to do fair work. Finally, there is a "saving remnant"—usually frowned upon by the rest of the class—who really delight in the challenge of classroom problems, and respond with all the power at their command. Lack of interest and effort on the student's part is regarded by many teachers, and by all parents of the status-possessing class, as a prefectly normal condition. There is thought to be something wrong with an adolescent boy or girl who evinces an actively intelligent interest in Latin, geometry, or history. Nevertheless, by means of various esoteric devices, the students are steadily kept moving up through the grades of "the system". A fair percentage of them, of course, obtain certificates and diplomas; but whether they obtain diplomas or not, they satisfy the status requirement if they merely pass through the system. There is no particular disgrace in failure.

This status concept pervades nearly every statement of the aims and objectives of modern education. These may be set down somewhat as follows:—

1. The transmission of the social heritage.—This includes training in the three implemental subjects—reading, writing, and elementary arithmetic; moral training, and character building; and training for citizenship and social life.

2. Transmission of the economic heritage.—This is primarily training for the business of making a living. The pupil is taught how to become an "efficient economic factor", either through industrial education—agricultural, technical, or commercial—or by preparation for entering one of the professions.

3. Transmission of the cultural heritage. — This is training for leisure: for avocational pursuits, mainly in the fields of literature, art and music, and the natural and social sciences. This training may be merely appreciative in scope; or it may prepare for creative effort and scientific research.

These three aims are sometimes amalgamated in the statement that education is preparation for complete living. In this view, the schoolroom is the vestibule of life, where the pupil is given some preliminary coaching before he passes on to that niche for which he is ordained. In the same way, modern school curricula have been "enriched" by the addition of as many different types of activity as possible, with the purpose of making the schoolroom a microcosm, or epitome of the great, wide world outside, of the macrocosm which the pupil will be ready to enter in due time.

These views bear unmistakably the impress of the status concept. They make education consist, essentially, in doing something to a boy, or something for him, before he reaches maturity; in imposing or fixing something on him: a vestige, one might almost fancy, of the Eleusinian Mysteries, or of some other such rites of primitive culture. Whereas the facts are that education is a process not ceasing at maturity, but continuing throughout life; and that the dynamic of all education worth the name is intellectual. Such education brings a boy to grips, intellectually, with the world as it really is. The world is his oyster, which he himself must open.

Such then is the role of status as the dynamic for present-day education. What are the evils that attend this status concept? In the first place, there are undoubtedly in our high schools far too many students of inferior ability; and many critics set down the overcrowding in those schools to this cause. But which, one may ask, is the greater offender: the student with inferior ability who does the best he possibly can, or the student with superior ability who does the least he possibly can? The behavior of both kinds of student is symptomatic merely; hence the exclusion of either kind, or of both kinds, from the high school, while it may relieve the congestion, will assuredly not cure the disease. A much more serious charge against status education is that it stifles a student's intellectual curiosity, and numbs his intellectual powers; and this at the very time in his life when his intellectual appetite is most likely to grow with what it feeds on. This result can be seen in the pupil's lack of initiative, in his inability "to do anything for himself". As he proceeds, therefore, from year to year, the amount of knowledge he actually possesses falls farther and farther below the standard required. Indeed, there seems to be no doubt that the average boy of fifteen years knows not more than half what he could know, were some motivation devised that would put him on his mettle. Lastly, how can the moral effect on the student of repeated failure with impunity be other than highly pernicious? In the outside world, failure is a disgraceful thing, attended with privation and hardship. In the high school, however, it is not really a serious matter; because the disgrace, in fact, usu-

ally devolves upon the teacher. The more intelligent students, of course, can detect this sham, and are thus brought to an attitude of contempt for education and all its works.

Can we then import into our educational system a new dynamic? Not without revolutionizing the whole structure of public education. But now assuredly, when our schools are overcrowded with indifferent and incompetent pupils, when our teachers are overworked and our taxpayers overburdened, it is high time to discuss, with more candor than ever before, this question of secondary education. The following questions, for example, might be canvassed with profit:—

Is it the interest of the state as a whole to further extend education of the types we now employ, and is it desirable to spend more money on this education without stint?

Should our secondary schools be maintained at state expense merely to house our juvenile unemployed? Should not all secondary education be placed on a part-time basis?

Should the state support professional schools; or technical, agricultural, and commercial schools? Should not all education that supports, profits, or dignifies a particular class be maintained by that class?

Is it true that our secondary education has been bedevilled by a type of learning that is traditionally honorific; and that the ostensible reasons for extending high school education are merely rationalizations subserving the concept of status?

Is it natural or necessary that teenage boys and girls should find no intellectual appeal in the subjects of the high school curriculum?

Is it true that social science is taught in our high schools "merely as an orderly presentation of conventional proprieties, rather than as a summons to grapple with novel and disconcerting facts that surround us on every side"?

Has any parent, any group of parents, any community, or any organization, the right to prescribe for our boys and girls what they shall think or believe about the social, economic, civil, or religious environment in which they are growing up?

"The primary duty of the school," said President Hadley, of Yale, "is to teach the habit, and train the powers, of thinking." Education, in other words, is primarily an affair of the intellect. For those who have traced, from the days of prehistoric man, the struggle of the human spirit for freedom, a struggle against superstitious fear and blind tradition, against tyranny and slavery, against almost every conceivable form of oppression—for such students of man's history, President Hadley's conclusion is incontestable. But the mind of man is still in the making; and as yet the great mass of mankind cannot think with the courage of the scientist and the precision of the mathematician. Such edu-

cation as will speed the day of intellectual emancipation for the human race is cheap at any price. On such forward-looking education we could well afford to spend an amount greater even than the cost of the Great War and of all our industrial disputes; for the recurrence of such struggles can be prevented only through the medium of true education. And by the same token, the very occurrence of those terrible struggles constitutes an irrefragable argument against the validity of our present-day education. "Mankind," says Dr. G. Stanley Hall, "must now reorient itself and take its bearings from the eternal stars, and sail no longer into the unknown future by the dead reckoning of the past."

"Ye shall know the truth, and the truth shall make you free."

THE ALBERTA SCHOOL CLUB

(See Page 8, September Number)

Last week a member asked for suggestions on the teaching of map drawing ot Grades VI. and VII. Before replying to this request we would like to know what your ideas are. If you have been successful in this department, please send in your suggestions.

H. G. Wells on Education

PART II.

In a former article we dealt with the problem of making our small number of really great teachers go around. The problem was to find some means of supplying education to the ever-increasing masses who want it. We have now to examine whether the type of education supplied in our schools is effective for its purpose.

Mr. Wells discusses this problem in a recent issue of the "Cosmopolitan."

In the first place, he gives it as his frank opinion that the public schools and universities of England do not give their students value for the cardinal years of their lives which they spend there. The four or more years are, in the case of the majority, wasted. The business of the educator has been that of "attracting, boarding, and amusing adolescents". And in the United States, conditions are not so greatly different. In Canada where more and more people are clamoring for the privileges of a high school education for their young men and women, where costs are mounting, and classrooms are crowded almost to suffocation, one may well put the question: What is the purpose of it all? Is it education, or are we merely finding the means of entertaining our adolescents until they are considered old enough to go to work? A brilliant American writer, Thorstein Veblen, dealt with this same problem some years ago. According to Veblen our modern culture is a pecuniary culture —it is based on the principle of "conspicuous waste"; i.e. of the spending of time and money wastefully in order to show one's pecuniary power—one's freedom from the need to do useful work. Hence the curriculum, the subjects taught, the methods of instruction, and the extra-curricular "activities" of our higher schools and colleges, have little or no bearing on industrial efficiency. They are reputable because they are industrially profitless. In this way it is possible for a young man or woman to graduate from a college or university without being brought face to face with any of the realities of life—with the battles about religion, or politics, or economics, or industry, or social environment and human society. Instead, they waste their time with years of lessons about literature and art, and Latin, Algebra and geometry.

"As early as fifteen or sixteen," says Wells, "a youth should be brought into contact with realities, and left in contact with realities from that age on. That does not mean that he will make an end of learning then, but only that henceforth he will go on learning—and continue learn-

ing for the rest of his life—in relation not to the 'subjects' of a curriculum, but to the realities he is attacking."

From this entertaining function of schools has came the idea of activities of all kinds, through which a student learns how to live. The school is a sort of universe in little, where the adolescent learns how he shall live his life when he goes out into the work-a-day world. Preparation for life, this is called. As a matter of fact, there is no such thing. Preparation for life is life itself. These things are but rationalized justifications for keeping a boy or girl living without finding something industrially useful for him to do.

Of our universities, Mr. Wells has this to say: "Apart from the modicum of technical instruction they impart, the upper schools and universities of our world betray themselves for an imposture, rather delaying, wasting and misleading good intentions, rather using their great prestige and influence in sustaining prejudice in favor of outworn institutions and traditions that endanger and dwarf human life, than in any real sense educating."

In other words, the universities have been weighed in the balance, and found wanting. They have failed in their trust, having given us no lead in the solution of present-day social problems. Their falde-ral of archaism and waste, their frippery of degrees and academic distinctions, in England, at least—has been made obsolete by the war. As a consequence, they are destined for oblivion in the years to come. Only the post-graduate schools and research centres have any real value for a modern intellectual. "The newer institutions," Mr. Wells concludes, "the research and post-graduate colleges, if you will, will offer no general education at all, no graduation in arts or science or wisdom. The only students who will come to them will be young people who are specially attracted and who want to work in close relation as assistants, secretaries, special pupils, collateral investigators, with the devoted and distinguished men whose results are teaching the world."

The Monthly Outline

NOVEMBER

GRADE VIII.

Arithmetic:—Interest and Promissory Notes.
Literature:—Home Thoughts from Abroad, From the Sea, Finding of Wisdom.
Supplementary Reading:—Short summaries from Ben Hur—The Chariot Race (Book V.), The Lepers (Books VI. and VII.)
Oral Reading:—Journey Southward.
Silent Reading:—Rip Van Winkle.
Composition:—Exercises on the Supplementary Reading, distinctions between sense, since, and similar forms. When to use "me-I", "she-her", etc. Two uses of the hyphen with examples for practice.
Grammar:—The Adjective—when to use endings "er, est" and when "more, most" irregular comparison, classes of adjectives. The Verb—kinds, agreement, principal parts, voice.
History:—Part IV. of the course. Civics: Part (c), page 143.
Agriculture:—Parts of the plant and their purpose, as in this issue.
Geography:—Scotland and Ireland. Review of England and the climate factors, particularly those affecting the British Isles.
Hygiene:—Nervous and Excretory systems. Alcohol and tobacco in relation to these.

GRADE VII.

Arithmetic:—Reading and writing of decimals, addition and subtraction of decimals, problems involving above, conversion of decimals to vulgar fractions and to percentages.
Silent Reading:—The Hippo Hunt. The Sky Pilot.
Oral Reading:—Mending the Clock. Kew in Lilac Time.
Literature:—Belshazzar's Feast. Treasure Island.
Memorization:—"If".
Composition:—Paragraphs, oral and written. A personal letter. How to address letters to various persons, using the proper titles; e.g., Mr., Mr., Miss, Master, Dr., Rev., Hon., Capt., etc. Salutations and complimentary close of letters.
Grammar:—Subject and predicate of Interrogative and Imperative sentences, and of elliptical or incomplete sentences. Placing words in natural order before analysis. Sentences with compound subjects and predicates.
Spelling:—Five words a day covering all of first term and supp. lists.
Citizenship and History:—As in this issue.
Geography:—Finish Eurasia as outlined in the prescribed Course.
Agriculture:—Combined with Grade VIII. See lessons of this issue.
Hygiene:—Secretory System. Review and Hygiene related to the topics.
Writing:—Practice combining the capitals with small letters following. Final "t". Initial forms of small letters different from their form within the word.

GRADE VI.

Arithmetic:—Multiplication of fractions. Compound fractions. Uses of the signs plus, minus, multiply, of, and brackets in their proper order.
Literature:—Scene from "William Tell". Memorize: Flanders' Fields, Love of Country.
Oral Reading:—A Thrilling Moment.
Dramatization:—Horatius at the Bridge.
Composition:—As in the lessons of this issue.
Citizenship:—Scottish Independence, Wallace, Bruce.
Nature Study:—As in the lessons of this issue.
Geography:—Complete North America and commence Canada.
Hygiene:—The Normal Pulse. A weak heart, precautions to take. First

aid for wounds and bleeding. Nose bleed. How to prevent infection of wounds.
Spelling:—As in October issue.
Writing:—t, s, r, G, S, D, 3, 5, ?, c, @.

GRADE V.

Arithmetic:—Square measure. Areas.
Literature:—Alan MacLeod. Memorize: The Rapid and Mariners of England.
Oral Reading:—November. Alan MacLeod, V.C.
Silent Reading:—Bruin and the Cook.
Story-Telling:—St. George.
Composition:—As in the lessons of this issue.
Spelling:—Lists and dictation reviewed and continued as in previous months.
Citizenship:—As in the lessons of this issue.
Writing:—p, j, y, g, f, j, z, V, U, Y, W, I, J, S, G, T, T, F, X, Z.
Nature Study:—Cultivated Plants. Wild Animals. (See page 32 of the Course.)
Composition:—Use of the dictionary. Correct use of "is", "was", "this", "isn't", "aren't", etc. Anecdotes for oral practice.

GRADE IV.

Arithmetic:—Multiplication by two and three figures. Denominate numbers in Measures of Capacity. Notation to millions. Roman notation. Rapid calculation.
Literature:—King Arthur's Sword. The Incape Rock.
Silent Reading:—The Living Line. The First English Singer. Three Trees.
Oral Reading:—The Frost. A Boy Here. A Meeting in the Rain.
Memorize:—Flanders' Fields. Sweet and Low.
Supplementary Reading:—Briar Rose.
Composition:—Compositions on such topics as: How We Surprised Mother. A Wounded Bird. Earning a Nickel.
Spelling:—As in previous outlines.
Citizenship:—Stories of Manners. Stories of Community History. Thanksgiving, Armistice Day, Quarantine, Golden Deeds, Great Friendships.
Nature Study:—Two winter birds. One fur-bearing wild animal. Star study. Origin of imported fruits.
Writing:—a, d, g, q, c, e, Q, Z, X, G, D, T, F.

GRADE III.

Arithmetic:—Complete addition. Carrying up to millions column. Subtraction using two figure numbers only. Dollars and cents. Coinage.
Literature:—A Frog Prince.
Memory:—A Japanese Lullaby.
Story-Telling:—Reynard the Fox.
Reader:—Pages 55-84.
Supplementary Reading:—Winston or other reader.
Composition:—Reproduction of Fables, finishing a half-told story, reproducing the literature lesson with emphasis on sequence. Stories from pictures. Abbreviations of day, month, and denominate numbers. A Xmas letter.
Spelling:—As in previous months.
Citizenship:—Thanksgiving, Armistice, Cleanliness, dependability, avoidance of mischief in school.
Nature Study:—Muskrat, Squirrel, Rabbit, Coyote. See Grade VI. of this issue.
Writing:—The one space letters. The capitals using ovals.
Hygiene:—Winter clothing, avoidance of draughts, causes of colds, correct breathing, bedroom ventilation.

GRADE II.

Arithmetic:—Add 3 to each number. Take away 3. Begin counting to 1,000 by 5's in any hundred. Begin writing and reading numbers up to three figures. Count by threes. Teach foot and yard.

Literature:—David and Goliath. Hare and Tortoise. Memorize: The Wind. My Bed is a Boat.
Oral Reading:—The Jackal and the Alligator. Gray and White. Country and City Mouse. (Silent) The Reason Why. The Two Kittens.
Composition:—Copy a letter. Question Mark. Reproduce "Snow Blanket". Dramatize "Chicken Little".
Spelling:—Third column—42 words. Two word families. Dictation.
Citizenship:—Meaning of the National holidays. Lessons on courtesy: "Thank You", "Yes, Miss —", etc.
Writing:—Capitals A, C, O, N, M.

GRADE I.

Arithmetic:—Counting to 50. What makes 6? Figures and objects for 8, 9, 10.
Reading:—Give the child the book. Read to page 21. Repeat: She called, I will, Not I, You would, You shall, Who will, They did, She did.
Phonics:—m, o, a, s, t, ee, p, l, o, h.
Language and Literature:—Memorize and dramatize: Bobby Shafter, The Old Woman Who Lived in a Shoe, Little Jack Horner.
Writing:—e, o, a, d, t, 9, 7. Combining letters.

History—Grade V.

By Mary Crawford, B.A., Instructor in History, Victoria High School Edmonton.

THE CHURCH IN THE NORTH-WEST

EXPERIENCES OF EARLY MISSIONARIES AND THE ESTABLISHMENT OF MISSIONS

LESSON 1.

THE REASON FOR MISSIONARY WORK IN THE WEST

Last month we travelled with the great explorers across the wide plains; over river and mountain to the Pacific and the Arctic Oceans. We discovered with them what a vast country there was still unexplored in 1800; a land where people with a spirit for adventure might find splendid soil to till, great resources in minerals and furs to develop—a place where the over-crowded, poverty-oppressed peoples of the Old Land might carve out for themselves a home. We saw, too, the beginnings of settlement in the many trading posts scattered over the country by the Hudson's Bay Company and the Company of the North-West.

Around each of these forts there gradually gathered **little groups of people.** There were **officers** of the **trading companies** and **"coureurs-de-bois",** the young Frenchmen who, forsaking the settled-down ways of their own people, took to the woods, ran with the Indians, lived their life and bought their furs. There were many **half-breed children;** part Indian, part French, English or Scotch. And there were the **pure Indians** who migrated back and forth over the country, selling furs to the white men and acting as guides. These were the pioneer settlers in the North-West and **on them would depend the future of the country.**

The trading companies did little or nothing to help these pioneers plan the best way to use the many things offered them in the new land. Traders, for the most part, did not consider themselves permanent settlers in the country. They came merely to get rich; then to return to their old homes, and enjoy their easily-won wealth. It was the **men of the different churches in Eastern Canada and the Old Land who saw the need of the people** and hurried forth with help.

They knew how easy it is for men far from home, from the influences of family, church, school and social life, to lose their ideals and sink into a degraded and self-seeking existence. They also saw the **children** of white men **growing up without education,** running wild like the Indians, and they knew that these people needed training if they

were to make the best use of the natural resources of the country, and build up fine, healthy, happy communities. So these **ambassadors of Christ,** forgetting self, always eager to tell the story of the carpenter of Nazareth, were **hard on the heel of the explorer and the trader.**

In fact, **missionaries** were to be found **among the very earliest pioneers.** A Jesuit priest accompanied Groseilliers and Radisson, sharing the hardships of the journey and ever ready with encouragement and comfort in hard places. Another who came out with Verendrye and his sons lost his life along with the eldest of the boys when a war-party of fierce Sioux attacked them, while they were attempting to bring back supplies from Lake Superior.

Early Missions on the Red River.—There were many other examples of individual missionary effort; but the **first definite work of all the churches was begun in the Red River Valley.** In 1811, Lord Selkirk, a Scottish nobleman and shareholder in the Hudson's Bay Company, obtained a grant of 110,000 square miles of land on the Red and Assiniboine Rivers. To this he brought within the course of ten years, about **300 emigrants from Scotland and Ireland,** people who fared badly in the Old World and were persuaded to try their fortunes in the New. In **religion, they were Anglican, Presbyterian and Roman Catholic.** These, together with the people of the trading companies, the half-breeds, the French, the Indians, and a few Swiss and Germans who had originally come to America as soldiers, made up the **mixed population** on the Red River.

The Roman Catholic Church on the Red River. — For six years this settlement was without a clergyman. Miles Macdonnell, a Roman Catholic who had helped Lord Selkirk to recruit the colonists from Ireland, **appealed to the Bishop at Quebec** to send out priests. The appeal was heard and in 1818 two men, **Provencher and Dumoulin,** came to the Red River. They had instructions to learn the dialects of the natives, and prepare grammars and dictionaries of the same; to preach the word of God and strive to enforce His laws; and to establish missions where possible. They travelled by the Lakes Nipissing, Huron and Superior to Fort William, thence by canoe to the Red River. At Fort Douglas they were greeted by a motley crowd of all ages and conditions, mostly French-Canadians and half-breeds. Some of them wept for joy at the sight of the two Black robes. The half-breeds were awestruck at the costume.

Their **first care** was to **provide themselves a home** for the winter. With logs of aspen they built a house fifty by thirty, part of which was at first used as a chapel. Within two months they had baptized sixty children and performed several marriage ceremonies. When their temporary residence was completed, they at once set to work to **build a regular church.**

The **colonists were difficult people** to help because of

their **unsettled habits.** When a pest of grasshoppers or the withdrawal of the buffalo drove them further up the river, the missionary followed. By 1830 they had three mission stations on the Red River with a school connected with each. **In 1837, the church was finished.** It was 100 feet long by 45 in width. It was the pride of the settlement, with its twin towers. A visitor to the Red River described the settlement and this **Church of St. Boniface** to the poet, Whittier, who made it the subject of the following poem, the "Red River Voyageur":—

Out and in the river is winding
The links of its long, red chain
Through belts of dusky pine-land
And gusty leagues of plain.

Only at times a smoke-wreath
With the drifting cloud-rack joins,
The smoke of the hunting lodges
Of the wild Assiniboines.

Drearily blows the North wind
From the land of ice and snow;
The eyes that look are weary,
And heavy the hands that row.

And with one foot on the water,
And one upon the shore,
The Angel of Shadow gives warning
That day shall be no more.

Is it the clang of the wild geese?
Is it the Indian's yell,
That lends to the voice of the North wind
The tones of a far-off bell?

The voyageur smiles as he listens
To the sound that grows apace;
Well he knows the vesper ringing
Of the bells of St. Boniface.

The bells of the Roman Mission,
That call from their turrets twain,
To the boatman on the river,
To the hunter on the plain.

LESSON 2.

THE RED RIVER MISSIONS—(Continued)

The Anglican Church: Rev. John West.—Meanwhile, the people of the Anglican Church in England had been learning of the North-West, and had **persuaded the Hudson's Bay Company to provide a chaplain for their people in Canada.** The choice fell upon **John West,** a young clergyman who had been reading missionary literature and learn-

ing of the Indians. In 1820 he bade farewell to his wife and three young children and set sail on the Eddystone for York Factory.

For nearly **one hundred and fifty years** there had been trading and bartering on the Hudson Bay but **no church and no school.** Mr. West planned to hold church services in as many forts as possible and to gather one hundred half-breed children from the scattered forts into a **boarding-school** on the Red River. He hoped, later, to do the same for the Indian children, for he believed that through the children they could teach the parents.

After two weeks at York Factory he set off for the Red River, taking with him Withaweecopo, a little Indian boy. Another joined the party at Norway House, and these two with a schoolmaster he had brought from England, were the beginnings of his school.

Arrived at the Red River, they set to work at once to **build the schoolhouse.** Mr. West **went out on trips to the different forts** of the Company, held services, and persuaded the people to **send their children** to the boarding-school. He founded the first branch in North-West America of the **British and Foreign Bible Society.** Through this means he had bibles in many languages, English, Gaelic, German, Danish, Italian, French, circulated among the different trading-posts.

As chaplain of the Hudson's Bay Company, his work was confined to the officials and children of the company. But he was eager to work among the Indians as well, so he persuaded the Missionary Society of the Church to provide money for a school for Indian children. In this way was begun the work of the Anglican Church in the West.

Other men followed Mr. West. In 1849, Mr. McCallum and Mr. Anderson did a fine piece of work in the establishment of a school. This was afterwards improved by **Bishop Machray.** The name of Bishop Machray is also connected with many other important events. He assisted in settling the country after the Riel Rebellion of 1870. By 1870 he had set up fourteen schools. He was the leader in the founding of the University of Manitoba, and was Chancellor until his death.

The Presbyterian Church: Rev. John Black.—Many of the Selkirk colonists belonged to the Presbyterian Church. At their request, Lord Selkirk had repeatedly asked that a minister of their own faith be sent to them; but action was long delayed, and **for forty years the Presbyterians on the Red River attended the Anglican services.** Still they clung to their own faith and kept up its forms in private family worship. At last, in **1851, John Black** who had been working among the French-Canadians, was sent to them. He was received with great rejoicing. Soon a **church and school** were established at **Kildonan,** and the customs so dear to the heart of the Scot were revived. He was followed

soon by **Rev. James Nisbet,** a skilful architect who helped them to build schools, and erected the first church of stone in the west.

Such was the Red River Colony in the early nineteenth century. Two scientists who travelled from Boston to the Hudson Bay to see an eclipse have left us a very interesting description of the settlement as they saw it before 1850. For **twenty miles** along the river between two trading-posts was **a long line of white-washed houses of the colonists,** neat and cosy, with log walks, thatched roofs, and wide chimneys of clay. Opposite Fort Douglas were the Catholic school and church of St. Boniface. Not far from Ft. Gibraltar were the Anglican Cathedral and school, and further down, Kildonan Presbyterian church and school.

They tell us that despite the differences in race and religion, **all were on friendly terms.** Summers were busy times. They had to till the soil and make preparation for the long, hard season before them. **In the winter the schools were filled.** Many of the scholars were young men who had to work all summer, but were eager to learn what little they could in their few weeks of idleness. There were **few books,** but these **were read with eagerness.** Under the guidance of the kindly clergy they formed little **social groups** and **debating clubs.** It is true that they were in constant fear of attacks from the fierce Sioux, and that these simple colonists suffered from the disputes between the rival trading companies. But so far as was possible the lamp of civilization was kept burning there by the fearless representatives of the church.

Missionary Work in the Far West.—The missionaries were by no means satisfied to confine their work to the Red River Settlement. **All of the churches went much further afield.** As trade extended westward and posts of the companies began to dot the prairie and to be established on the shores of the northern lakes, the **church marched abreast of the trader** holding aloft the torch of civilization and Christianity. **Wherever was a fort, there soon was a mission, perhaps two or three.**

Difficulties of Missionary Work. — This was no easy task for the workers. They made their lonely **way on horseback** or on foot through primeval forest, **their roads marked only by blazed trails.** They **slept beneath the forest shade,** kindling watch fires to keep at bay the prowling bears or wolves; or perhaps they found a generous welcome in the log shanty of some pioneer settler and could rest their weary bodies on a bed of pine boughs. In the **winter they travelled in clog-sleds and on snow-shoes.**

One of the greatest dangers for both men and dogs was the **frozen rivers.** Rivers freeze gradually, the most northerly part first. The waters flowing north pass over the frozen surface, are thrown back and frozen in all shapes, large blocks, hillocks, gullies, hummocks of ice.

These **cut the feet of the dogs or the snow-shoes of the travellers.** But the **smooth surface was even more dangerous.** Perhaps, all unaware, they would come to thin ice; then dogs, sleds and drivers would go through and the blocks of ice would close over them.

The **driving blizzard,** too, took its toll of fearless travellers. A story is told of a Jesuit priest who tried to make his way across the ice of Great Slave Lake to a post on the other side. His party was caught in a blinding snowstorm, the trail was soon covered over, and for hours they had to let the dogs take their course. Finally, they could go no further. Then they had to unyoke the dogs from the sled and let them run free. The priest and the boy, Baptiste, who was with him, took turns at this. It was slow work, for they dare not uncover their hands lest they freeze. Having freed the dogs they put blankets on the sled and crawled under it to get protection from the storm. The priest took the boy in his lap to keep him warm. Their great struggle was to keep awake. When the storm had lessened its fury they walked on until they came to a snow-drift. They dug a hole in it with their snow-shoes, lined it with blankets, crawled inside, and stayed until day dawned and rescue came. Their feet were badly frozen and they were worn out from the hours of struggle against the storm and cold.

Added to the difficulties of climate and travel were the **troubles they had in procuring supplies and provisions.** They tried, in the summer, to prepare for the winter months. Goods were brought from Eastern Canada by way of the Great Lakes, or from the Old World in the ships of the Company. Missionaries were transferred from one post to another, houses built, and everything that could be was done to make ready for the months of severe weather.

The most discouraging thing of all was that the **whites and half-breeds set such a bad example to the Indian.** While the missionary was teaching him the evils of robbery, cruelty, violence, and drunkenness, the Paleface was selling him the whiskey, which made of the poor Indian a madman. Yet the missionaries persevered in their work, confident that in the long run they would bring these wild people to a better mode of life.

LESSON 3.

STORIES OF THE LEADING MISSIONARIES

The history of missionary life in the North-West is **the story of the heroism of many men,** both Protestant and Roman Catholic. We could not begin even to name them all, but a few stand out as prominent figures and of these we shall give some account.

Roman Catholic: Tache and Lacombe.—With the work of the Roman Catholic Church in the west, we always connect the names of Bishop Tache and Father Lacombe. In **1846 Tache, in company with Abbe Lafleche, was sent out**

from St. Boniface with directions to go as far west as he could. They settled at first at Ile a la Crosse in Northern Saskatchewan, about two hundred and fifty miles south of Lake Athabaska. The trader at the post kindly gave them rooms with him until they could get a mission house built, and they settled down to the business of **learning the Cree language.** This was difficult, for their teacher, a blind Indian, knew no French. Abbe Lafleche, who was in poor health and could not endure the hardships of travel, remained at the mission; but **Tache was young and vigorous, and rapid on the snow-shoes.** He made long journeys in all directions, visiting the posts and the Indian encampments.

For five years they were very happy in their work. But in 1851 Tache was called back to St. Boniface and asked to become bishop over the whole diocese and direct the activities of the other missionaries. For forty years more he carried on this work. **He preached and wrote** to get the Catholics of the civilized world to take an interest in the North-West. He went to Eastern Canada, to France, and to Rome, **explaining the need and asking for aid.** Then he would hurry back and **visit all the posts** in the west, bringing help and encouragement to the priests. No journey was too difficult for him to undertake. He suffered many a hardship, and more than once came near losing his life.

During one of his many journies he ran a risk that tells a great deal. He was travelling on snow-shoes with young Father Vegreville. Late in the day, the Bishop who had eaten nothing since his fish breakfast, fainted and fell in the snow. He recovered and again went on walking with difficulty and perspiring freely. He fainted again within a few miles of their destination. Recovering once more, he told the Father that if he fainted a third time, his companion must scoop a hole in the snow, leave him there, go in all haste to the mission, and send out the dog-sled. This was what had to be done as the only way of saving the Bishop's life. The perspiration freezing on his body brought him back to consciousness out of his third faint. He got up and walked on to keep warm. He was really ready to drop again when he saw afar off the sled coming in all haste to his rescue.

He was at **Lac La Biche** for the **building of the church.** Today when a church is erected an honored official visits the district and places in position the **foundation stone.** Tache cut down with his own hands the first tree to be used in building the church.

All our Western Canada today are little Catholic settlements and churches, the result of the untiring labours of the clever and courageous Tache.

Father Lacombe.—The name, which above all others of the Roman Catholic pioneers, has meaning for the people of **Alberta**, is that of Father Lacombe, who laboured in this country **from 1849 until 1910.** He was the son of a French

habitant at Quebec. From his mother he had inherited a keen mind and some of the wandering, adventurous spirit of the Indian, so that when he was a little boy he was called affectionately by the priest of the parish "le petit sauvage". He worked with his father on the farm in the summer, and in the winter, attended school. When he longed to go to college, his friend, the priest, helped ot pay his way. He soon chose to become a priest and selected as his field the North-West of America.

At the **age of twenty-two,** he set out from Lachine for the Red River. He travelled through the southern country, now the United States, to St. Paul. There, after a month's delay, he was met by Father Belcourt with a train of clumsy carts, drawn by oxen and manned by a couple of former Hudson Bay servants, a metis (half-breed) and an Indian. After a brief stay, they loaded the carts with supplies and made their way over the worst of rough and muddy trails to Pembina.

It fell to Father Lacombe's lot the next year to be **chaplain of the buffalo hunt.** This was the great occasion, for on the buffalo they depended for a variety of supplies. Unfortunately he had cut his foot with an axe; but the metis begged that he might go, promising to take every care. He was propped up in a Red River cart, made comfortable with blankets, and off he went with the great procession of over eight hundred carts, a thousand men, women and children and hundreds of ponies, cart-horses, oxen and dogs.

It was a thrilling experience for him. But it was also something more than an adventure. He was the **father of the party, physician, adviser, settler of all disputes.** Every morning mass was said in his tent, during which there was perfect stillness in the camp, for the Indians and metis respected the prayers and meditations of the **"Praying-Man".** During the day there were **classes for the children, women and aged people,** left in camp while the men hunted. On days when the hunters rested they would listen to him talk or **help him with the language.** In the **evening,** when the little coppery babies had fallen asleep and the dogs were silent, he would **gather the whole camp around his tent for singing and prayers.**

Two years were spent in this way, working in the parish and studying the language. In the summer of **1852 he was sent to Edmonton.** He travelled all the way with the kindly Hudson Bay factor. When the boats were seen from the fort coming up the river, the flag was run up, cannons saluted, and the inhabitants flocked down the winding path to the river to bid them welcome.

Father Lacombe spent the winter in the fort. He was treated with every kindness by the Hudson Bay officials and was assisted in holding service for the one hundred and fifty inhabitants. He also found a good man to tutor him in the Cree dialect. When spring came he settled at **Lac**

Ste Anne, fifty miles north-east of Edmonton. A mission to the Crees had been established there in 1842. It was a suitable place, because the soil and fishing were good and there was plenty of food. Father Lacombe improved upon it. He taught the metis to till the soil, planted a garden for the mission and brought out nuns to start a convent for girls.

He then established a **mission** at **St. Albert** at the request of the Blackfeet tribes. He had been summoned to give help to these Indians when scarlet fever was raging among them; and though there had been little he could do, his kindness and sympathy had endeared him to them and they asked for a mission. He and Bishop Tache selected a spot on a hill north of the Sturgeon River, and here today can be seen a splendid Catholic mission, the result of the efforts of these two pioneers. They set to work to establish themselves during the summer months. Father Lacombe **was the ruling spirit;** now in the saw-pit, helping with logs; now at work on the houses; or again in the fields behind the plough, which he had had sent out from the East. Before winter, twenty metis had settled themselves there in log houses. In the spring he decided he must have a bridge across the river. He tells how, after mass on a Sunday, he announced that he meant to build a bridge. Then he said, "If any of you does not help me, that man will not cross on the bridge; he will go through the water. Yes, I will have a man there to watch." Next mroning the whole settlement came out and the **bridge was built.**

His next move was to **get his supplies direct from St. Boniface** without paying high freight rates to the Hudson Bay Company. To do this, he organized a **brigade of Red River carts** and accompanied them to the Red River and back with supplies. The journey took a month each way. On his return he brought with him a priest who was to open a **school in Fort Edmonton.** This, the first regular school west of Manitoba, was held in a log house within the fort. There were twenty pupils, the children of the Company's clerks and servants. They wore deerskin garments and leggings, and carried lumps of pemmican or dried meat in their pockets as dainties. They were very different from ordinary school children. "At the sound of the voyageur's songs or cheers in autumn, they flew like arrows out to the bank to welcome the brigade home. When gunshot signals arose from the southern bank, they rushed to see what stranger would return in the boat sent across from the fort. They were as wild as hares."

In 1864 he was directed to travel over the whole field when Indians roamed and missions were centred. From then to 1910, the story of this splendid old "Man-of-the-Good-Heart"—is the story of many fine deeds, of hardships endured, of constant effort and unflagging enthusiasm. He brought comfort to the tribes afflicted in a smallpox epidemic. He lived whole summers with the Indians. He wrote

books in Cree. He travelled to Eastern Canada and to Europe begging for money for his work. When the Canadian acific Railway was begun he acted as chaplain for the construction camps. When the rtibes were stirred to rebellion, he joined with the missionaries of the other churches in persuading the Indians to keep the peace and sign a treaty.

One of the great disappointments of Father Lacombe's life was the **giving up of the half-breed settlement at St. Paul de Metis.** His idea had been that if he could keep the half-breeds together, teach them to till the soil, make homes, and set up a community life, he would save them from the evils of going to town, loafing about the fort, and mingling with the white people. At the end of fifty years only eighty families had come, and many of these did not remain. Tilling the soil was too hard work and not sufficiently exciting. Finally the idea of the settlement was given up.

His two latest achievements were the Boys' School at Dunston, south of Calgary, and the home for aged people in Alberta. He believed that the best way to persuade the Indian tribes to live a settled life was to train them to engage in industry. He appealed to the Dominion Government, and as a result Industrial Schools were established at Battleford, Qu'Appelle, and Dunston.

Father Lacombe received the fifteen boys at Dunston, himself. They were shown wash tubs and instructed to bathe. They were then supplied with fresh clothing, served a good supper, and sent out on the prairie to play. A bell called them in to prayers and bed. They were highly amused by the stairway and entertained themselves by running up and down. The dormitory with its rows of beds was a source of further entertainment. They laughed, sang and made fun of the odd furniture. They examined the beds, explored them above and below, and punched the pillows. Some crawled under the beds and hurled things at those who ventured to lie on top. There was no sleep in the mission that night.

And so it continued through the winter. The boys were too old to be broken in to school. They would turn the playground into a battlefield. Often, at recess, they would slip away and when the teacher rang the bell they were nowhere in sight. Some of them ran back to their own people. Later, however, younger children were persuaded to come to the school. Nuns came out to teach the girls and a good beginning was made in industrial education for the Indians.

The building of the Home was a still more difficult task. Father Lacombe got a grant of over two hundred acres of land from Mr. Burns of Calgary. Lord Strathcona donated $10,000. When $20,000 more had been collected, they began to build. The splendid old man, now eighty-four years old, lived nearby and enjoyed seeing the building rise on its foundation. It was completed and opened in 1910. But there was no means of keeping it supplied. Again

Father Lacombe set to work. He obtained a promise of supplies of meat from P. Burns, coal from Lethbridge, potatoes from St. Albert, and more funds to supply the other necessaries. Thus, having done all that one man could to make life more comfortable and happy for the people of his own and of future generations in Alberta, the aged priest lived out his remaining few years, rejoicing that he was able to see the good results of his years of hard service.

LESSON 4.

THE METHODISTS: RUNDLE, EVANS, THE McDOUGALLS

The first missionary of any church to reach Alberta was the **Rev. Robert Rundle.** In 1840 he was sent out from Norway House, then the centre of Methodism in the West, to Edmonton. From there he made his way to **Pigeon Lake,** when for months at a time he lived with the Indians, shared their wanderings and hunting expeditions, and taught them with great success.

James Evans, another Methodist, did a very important piece of work when he perfected a **syllabic system for the writing of the Cree language.** For each syllable of a word he invented a sign. At that time there was no printing-press, type, or paper in the country. The Hudson Bay Company did not want it: civilization interfered with the fur-trade. So with a pocket-knife, he whittled out a type from blocks of wood. He made ink from chimney-soot, and printed his first translations on birch-bark. Later, he made moulds from the lead taken from tea-chests and old bullets, and cast his first leaden type from these. It was some time before the Company would allow a printing-press to come in, and then only on the understanding that it would be used for religious instruction only.

George and John McDougall.—Of the many Methodist missionaries in the West, the two whose names became household words in Alberta were the two McDougalls, father and son. **Rev. George McDougall** was first stationed at **Norway House.** From that centre he worked among the Indians in Saskatchewan. When his **son, John,** grew up and went into the work, they **came together into Alberta** and pioneered in the country south of the Red Deer River. In the north, the Hudson's Bay Company had been keeping order, and several missions had been established, but the **South was still without religion or civilization.** Here the Indian warrior was in his glory, and the white man was almost equally wild. Murder, robbery, and massacre were constant occurrences; but when whiskey was running riot many things happened which were shocking in their brutality.

After a trip to the southern part of the province, the McDougalls decided to **open up a mission at Bow River.** There was a great deal of **danger and difficulty** in the undertaking, and many a time their lives were spared only because they had at some previous time, proved themselves true friends of the Indian. The constant complaint of the

tribal chiefs was that the white man had brought fire-water which had done the Indian great harm; that the white man was bad and cruel; he had killed many Indians, and had ruined many more with whiskey. These missionaries promised to do their best to stop the evil, and they **constantly kept their petitions before the government,** until, finally, the sale of liquor to the Indians was forbidden by law.

Both the father and the son had the **pioneer heart.** They loved the great open country, they loved the untamed tribes of the prairie, and they **feared nothing.** They travelled back and forth on snow-shoes, in dog-sleds, in canoes, on horses, or in buck-boards behind wild bronchos. The missionary in those days had **many duties.** He had to hold meetings; attend Councils; visit the sick; act as doctor, surgeon, magistrate and judge. It took men of imagination and daring, and, above all, a sense of humour.

The Rev. John McDougall always saw the amusing side of any situation, and in his books, "Saddle, Sled and Snow-Shoe" and "On the Western Trails in the Early Seventies", he has given us many entertaining **stories of his experiences.**

He tells of a race he won in competition with the Indians. They challenged the white men at the mission to send two to race with two braves. "I," says Mr. McDougall, "was asked to be one, and a man by the name of McLean was the other. Men, women, and children came in crowds to see the race. The two Indians came forth, gorgeous in breech-cloth and paint. My partner lightened his costume, but I ran as I worked. The race was to be run from one tent to another, around it and back home again, a distance in all of more than two-thirds of a mile. At a signal we were away and with ease I was soon ahead. When I turned the tent I saw that the race was ours, for my partner was the first man to meet me and he was a long distance ahead of the Indians. When within three hundred yards of the goal, a crack runner sprang up before me, and dropping a buffalo-skin from his body, sped away with the intention of measuring his speed with mine. I had my race already won—but this saucy action nettled me and I soon came up, passed him, and came in about fifty yards ahead. Thus I had gained two races, testing both wind and speed. That race opened my way into many a lodge and to the heart of many a friend. It was the best introduction I could have had to the Indians."

Another time he describes Christmas Day, 1864, as they spent it at a mission on the Saskatchewan. He says: "We were cut off from mails, telegrams, newspapers, and a thousand other things men hold dear. Yet we were happy and well, and Christmas day was full of pleasant excitement. We had no organ or choir, but we all sang. We had no church, but the log shanty was as the vestibule of heaven. Our preacher was not robed in broadcloth, nor graced with

a linen collar, but his speech came with power and made us see before us grand ideals to which we felt we would fain strive. We had no roast beef nor pumpkin pie, nor plates of tempting fruit. But we had buffalo tongue, beaver tail, moose nose, wild cat, prairie chicken, rabbit and pemmican. We had no flashing cutters and prancing horses, but we had wild driving over hill and dale in dog-sleds. We ran races, played football, and made this part of the Saskatchewan ring with our fun."

There are many things to the credit of the McDougalls. The Rev. George McDougall, along with splendid men of the other churches, did much to comfort and reassure the Indians at the time of the rebellion in 1870. He and Mr. John McDougall helped to keep the Crees and Blackfeet quiet in 1885. It was to the latter that the government at Ottawa gave the difficult task of explaining to the Indians that Mounted Police were being sent out to put down warfare and that the Indians would be protected so long as they lived peacefully. Mr. John McDougall was the friend of the Indians during the confusing time of change from their wild and free life to the customs and government of white men; and it was he who used his influence in the early days, that the Indians might get the preaching and teaching they could understand, when they were put under government protection on the reserves.

It was the "praying-men" of the different churches, who were the real founders of Christian civilization in the North-West. Their spirit lives on in the land and the scenes of many of their sacrifices and achievements are marked by place names today; for example, Vegreville, Leduc and Lacombe.

Composition—Grade VI.

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NOVEMBER OUTLINE

(15 Lessons; 31 Exercises)

Lesson 33—Paragraph Study—Thought and Tone.
Lesson 34—Oral Preparation; Essay—William Tell.
Lesson 35—Paragraph Study—Methods of Keeping Unity.
Lesson 36—Action Words.
Lesson 37—Action Words—Verbs. Review.
Lesson 38—The verb—"to be".
Lesson 39—Oral Preparation; Essay—Daniel.
Lesson 40—Punctuation—Review.
Lesson 41—Repetition of Words—Review.
Lesson 42—Lie and Lay.
Lesson 43—Pronunciation and Vocabulary Exercises.
Lesson 44—Correct Use of Words.
Lesson 45—Correction of Errors.
Lesson 46—Abbreviations and Enlargements.
Lesson 47—Oral Preparation; Essay—A Boy Scout's Busy Day.

LESSON 33

PARAGRAPH STUDY—THOUGHT AND TONE

It has already been noticed that the **Key-word** of the topic sentence tends to indicate the **tone** of the paragraph. This being so, it is not always necessary to maintain connection with the topic sentence by the use of definite words in each following sentence, provided the tone first expressed is well preserved. The tone of the paragraph must not be confused with the topic, though the latter may, and usually does, indicate the former. The **topic** tells what the paragraph is to be about, but the **tone** indicates the manner in which we are to view the topic. It indicates the **feeling** desired to be aroused in us as we read. This feeling may be one of sorrow, or pity, or affectation, or humor, or delight, or fear, or excitement, or danger, or courage.

Tone may be maintained by the use of a variety of words which have no reference to each other in **meaning** but each of which hints distinctly at the **tone** first expressed. It follows, however, that if these words actually do refer to each other or the Key-word in meaning as well as in tone the unity of the paragraph is thereby strengthened. Sometimes the tone is heavily emphasized in the topic sentence. Frequently an effort is made to **startle** the reader into the desired feeling. At other times there is very little tone or feeling expressed in the paragraph. Nevertheless, it is just this difference in tone which makes a paragraph interesting,

or monotonous and tiresome. It is of first importance for us to realize that it is necessary to arouse a definite feeling in the reader and that this feeling **must be maintained** in each sentence of the paragraph. The method and purpose of indicating and preserving the tone is of fundamental and vital importance in paragraph study. In the following exercises we will consider only the **manner of maintaining** the tone.

Observe the following:

Crash! a **terrific cry** broke from three hundred hearts. The White **Ship had struck** upon a rock—**was filling—going down!** Fitz-Stephen **hurried** the prince into a boat with some few nobles. "Push off," he **whispered,** "and row to the land. It is not far, and the sea is smooth. The rest of us **must die."** But as they rowed fast away from the **sinking** ship, the prince heard the voice of his sister **calling for help.** He never in his life had been **so noble** as he was then. He **cried in agony,** "Row back at any **risk!** I cannot **bear to leave her!"**

Note: The topic is—"The Sinking of the Ship."

The topic sentence is—"Crash! a terrific cry broke from three hundred hearts."

The **tone** is one of **danger and fear** indicated in the words **Crash** and **terrific cry.**

The words and phrases maintaining this tone are in heavy type. Now these words preserve the unity of the paragraph not so much by definite reference in meaning to the Key-words as by maintaining the tone they indicate. Scarcely any two expressions mean the same. "Hurried", "whispered", "cried in agony", are quite different but each expresses fear and danger.

In the following exercises study how unity is maintained. Select the topic sentence. Underline the Key-words. Name the topic of the paragraph and state the tone indicated. Underline each word in the paragraph that helps to maintain the tone. Underline also any words that definitely refer in **meaning** to the Key-words.

EXERCISE A.

By and by a sad misfortune came upon this happy little family. The good, kind mother became ill; and although her daughter waited upon her night and day with loving care, the sick woman grew worse and worse, until at last they knew that she must soon die. When she found that she must leave her husband and child, the poor woman felt very sorrowful, grieving for those she should see no more, and most of all for her little daughter. She called the girl to her and said: "My darling child, you know that I am very ill: soon I must die, and leave your dear father and you all alone. When I am gone, promise me that you will look into this mirror every night and every morning: there you shall see me and know that I am still watching over you."

With these words she took the mirror from the secret place where it was kept, and gave it to her daughter. The child promised, with many tears, to obey, and the mother, having become calm and resigned, died within a short time.

EXERCISE B.

One morning the magician set out with Aladdin to show him something very wonderful. At length they came to a valley which separated two mountains. Aladdin was directed to gather dry sticks and kindle a fire. When this was done, the magician, pronouncing certain magical words, cast a perfume into the blaze. Immediately a great smoke arose, the earth trembled and opened, showing a large, flat stone. Then he said to the frightened boy, "There is hidden under that stone an immense treasure, which you may possess if you will carefully follow my instructions." Aladdin promised exact obedience. The magician then embraced him, and putting a ring which would protect him from danger upon his finger, bade him pronounce the names of his father and his grandfather and raise the stone. Aladdin obeyed, and discovered a hole several feet deep, and steps to descend lower.

EXERCISE C.

Nevertheless, Mr. Toil had a severe and ugly countenance, especially for such little boys and big men as were inclined to be idle; his voice, too, was harsh; and all his ways and customs seemed very disagreeable to our friend Daffydowndilly. The whole day long this terrible old schoolmaster sat at his desk overlooking the scholars, or stalked about the schoolroom with a certain awful birchrod in his hand. Now came a rap over the shoulders of a boy whom Mr. Toil had caught at play, now he punished a whole class who were behindhand with their lessons; and, in short, unless a lad chose to attend quietly and constantly to his book, he had no chance of enjoying a quiet moment in the schoolroom of Mr. Toil.

EXERCISE D.

Ranald meantime was gradually holding in the colt, and the pony drew away rapidly. But as rapidly the wolves were closing in behind him. They were not more than a hundred yards away, and gaining every second. Ranald, remembering the suspicious nature of the brutes, loosened his coat and dropped it on the road; with a chorus of yelps they paused, then threw themselves upon it, and in another minute took up the chase. But now the clearing was in sight. The pony was far ahead, and Ranald shook out his colt with a yell. He was none too soon, for the pursuing pack, now uttering short, shrill yelps, were close at the colt's heels. Lizette, fleet as the wind, could not shake them off. Closer and closer they came, snapping and snarling. Ranald could see them over his shoulder. A hundred yards and more and he would reach his own back lane. The leader of

the pack seemed to feel that his chances were swiftly slipping away. With a spurt he gained upon Lizette, reached the saddle-girths, gathered himself into two short jumps, and sprang for the colt's throat. Instinctively Ranald stood up in his stirrups, and, kicking his foot free, caught the wolf under the jaw. The brute fell with a howl under the colt's feet, and next moment they were in the lane and safe.

EXERCISE E.

The two children went merrily up the mountain. During the night the wind had blown the last clouds away. The sky was deep blue, and in the centre stood the bright sun, sparkling upon the green Alps. Heidi ran hither and thither and shouted with joy. The mountain path led through great patches of fine, red primroses. Yonder it glistened all blue with beautiful gentians, and everywhere laughed and nodded the tender-leaved, yellow rock-roses. In her delight over all the glittering, nodding blossoms, Heidi even forgot the goats and Peter, too. Now here and now yonder shone the red and yellow, and enticed the child in every direction. So Peter had to look on all sides, and his round eyes, that did not move quickly from one thing to another, had more work than they could well manage. The goats also ran here and there, and the boy whistled and called and swung his staff to drive all the runaways together.

EXERCISE F.

As the vessel pitched to and fro, the leak became worse and worse. Had the engines been able to work, the crew might have won through; but the boilers were leaking, and no steam could be got up. Further, the helm refused to answer in the heavy sea. The sails, which had been taken in for fear of the gale, had to be hoisted again. The storm now burst upon the ship in all its fury. The waves surged mountains high, the sleet drove thick and fast, and a dense fog enveloped it on every side. The tide set strongly to the south, and the crippled vessel, wheeling round, drifted helplessly along with it. Before the morning broke the Forfarshire had struck on the rocks. The sea lifted her for a moment and then dashed her down again with such fury

that no timber could resist the shock. She broke off sharp amidships, and a swirling eddy swallowed up the stern, while the fore part stuck fast on the rocks.

LESSON 34

ORAL PREPARATION FOR ESSAY WRITING

Essay Subject

WILLIAM TELL

The oral preparation for this essay may take the form of a general discussion of the most suitable plan to be followed. After the plan is outlined the story may be told in sections; that is, one pupil will relate only that part of the story that will be finally written in one paragraph. The class may then discuss each speech, chiefly with a view to finding out whether necessary material has been omitted or unnecessary material included.

LESSON 35

METHODS OF KEEPING UNITY

As might be expected and as already indicated, it is customary to preserve connection with the topic sentence by both methods, namely, by words referring definitely in **meaning** to the Key-words, and by words or phrases preserving the **tone** indicated. A further study of unity in the following exercises will emphasize each method and also show the value of each method in the particular paragraph.

As before, select the topic sentence, and the Key-words. State in your own words the topic of the paragraph and the definite tone expressed. Select the words that refer definitely in **meaning** to the Key-words. Select the words or phrases that maintain the tone. State which method is used to the greater extent for each particular paragraph. Some paragraphs tell about people or things. Some describe places or people. Some express strong feeling or emotion. In which of these is unity kept by words referring definitely in meaning to the Key-word? In which is unity kept by preserving the tone?

EXERCISE A.

It was very interesting to lie awake in the night and hear the clocks strike. First would come a faint striking from one of the churches in the by-streets, a modest sound; then from another quarter would be heard a more confident clock striking the hour clearly and distinctly. When they were quite ready, but not a moment before, the seven bells of the large church on the square would chime the hour. The sound of these bells seemed to wake up the stone man in the tower of the town building and he struck the hour with his hammer. And when every sound had died away, the iron donkey would kick out the hour on his bell.

EXERCISE B.

The boy has nearly reached the place where the path divides when he starts up a young white owl that can scarcely fly, and it goes whirring along close to the ground before him. He gains upon it; another moment, and it will be his. Now he gets the start again; they come to the branching of the paths and the bird goes down the wrong one. The temptation to follow is too strong to be resisted. He knows that somewhere, deep in the wood, there is a cross track by which he can get into the path he has left. It is only to run a little faster, and he will be at home nearly as soon. On he rushes; the path takes a bend, and he is just out of sight when his pursuer comes where the path divides. The boy has turned to the right; the man takes the left, and the faster they both run the farther they are asunder.

EXERCISE C.

On entering the amphitheatre new objects of wonder presented themselves. On a level spot in the centre was a company of odd-looking personages playing at nine-pins. They were dressed in a quaint outlandish fashion: some wore short doublets, others jerkins, with long knives in their belts, and most of them had enormous breeches of similar style with that of the guide's. Their visages, too, were peculiar: one had a large head, broad face, and small piggish eyes; the face of another seemed to consist entirely of nose, and was surmounted by a white sugar-loaf hat set off with a little red cock's tail. They all had beards of various shapes and colors.

EXERCISE D.

The carriage could not have gone above a mile or two when a pretty young girl came along with a tripping pace, which showed precisely how her little heart was dancing in her bosom. Perhaps it was this merry kind of motion that caused—is there any harm in saying it?—her garter to slip its knot. Conscious that the silken girth, if silk it were, was relaxing its hold, she turned aside into the shelter of the maple trees and there found a young man asleep by the spring! Blushing as red as any rose that she should have intruded, she was about to make her escape on tiptoe. But there was peril near the sleeper. A monster of a bee had been wandering overhead—buzz, buzz, buzz—now among the leaves, now flashing through the strips of sunshine, and now lost in the dark shade, till finally he appeared to be settling on the eyelid of David Swan. The sting of a bee is sometimes deadly. As free hearted as she was innocent, the girl attacked the intruder with her handkerchief, brushed him soundly, and drove him from the maple-shade. How sweet a picture! This good deed accomplished, with quickened breath and a deeper blush she stole a glance at the youthful stranger, for whom she had been battling with a dragon in the air.

EXERCISE E.

The great error in Rip's composition was an intense hatred for all kinds of profitable labor. It could not be from want of diligence or perseverance, for he would sit on a wet rock with a rod as long and heavy as a Tartar's lance, and fish all day without a murmur even though he should not be encouraged by a single nibble. He would carry a fowlingpiece on his shoulder for hours together, trudging through woods and swamps and up hill and down dale, to shoot a few squirrels or wild pigeons. He would never refuse to assist a neighbor even in the roughest toil, and was a foremost man at all country frolics for husking Indian corn or building stone fences. The women of the village, too, used to employ him to run their errands and to do such little odd jobs as their less obliging husbands would not do for them:—in a word, Rip was ready to attend to anybody's business but his own; but as to doing family duty and keeping his farm in order, he found it impossible.

LESSON 36

ACTION WORDS

Observe the following:

The dogs **run.**
The birds **fly.**
The boys **play.**

"Run" tells what the dogs **do.**
"Fly" tells what the birds **do.**
"Play" tells what the boys **do.**
These are called "doing" or "action" words.

EXERCISE A.

Select the action words in the following:

1. The Indian built a canoe.
2. The wind blew and rocked the cradle.
3. The mouse came to the lion.
4. He gnawed the ropes.
5. The robin sings merrily all the day.
6. The snow covered the ground.
7. The cat caught a little bird.
8. The fisherman went home to his wife.
9. The hunter shot a large deer.
10. She opened the window.

EXERCISE B.

Make sentences using one of the following action words in each sentence:
shoot, fly, march, go, fight, spend, tie, enter, walk, give, catch, eat, look, come.

EXERCISE C.

Choose suitable action words to fill in the blanks:

1. Dick built in a very fine house.
2. He ——— to their stories.
3. The driver ——— that Dick was very poor.
4. He ——— the driver of the wagon for the ride.
5. After a while he sat down in a dark corner.
6. He slept himself to sleep.
7. The owner of the house came to dinner.
8. He ——— the ragged little fellow to sleep.
9. Alice wondered why Dick did not come in.
10. Dick put puss down to the ship.

LESSON 37

ACTION WORDS—VERBS—REVIEW

Just as we call "name words" nouns
So we call "action words" verbs.

A verb is the word in the sentence that tells what the subject **does,** or what we **say about** the subject.

Review subject, predicate and nouns.

EXERCISE A. Oct 37.

Divide these sentences into subject and predicate, pick out the nouns and verbs:

1. The beautiful heather | peeped | with one eye over the edge of the mountain.
2. Branches and needles | stood | on end in surprise.
3. Its leaves | quivered | in the sunshine and the dew.
4. The fir | took | long strides in the heat of the sun.
5. The juniper and birch | stood | on the edge of the forest.
6. The naked mountain | hung | over the valley.
7. The brook | went | down the hillside into the river.
8. The north wind | forced | its way through the gorge.
9. The birch | looked | up the mountain.
10. Both sides of the gorge | were | near the stream.

LESSON 38

THE VERB "TO BE"

Most of the verbs we have studied have a definite meaning, such as look, run, jump. We, at once, know what each of these tells us. There is, however, one verb which we use very often that has not as clear a meaning. This is the verb "to be". It is used to join the subject and predicate together and for this reason is called a "coupling" word. Nevertheless it is a verb just as much as any other verb and

must be considered part of the predicate. It has many forms, of which the commonest are:
am, is, are, was, were, has been, have been, shall be, will be.

Examples:

I **shall be** ten years old tomorrow.
They **were** here a few minutes ago.
You **have been** late many times.

EXERCISE A.

Divide these sentences into subject and predicate. Underline the verbs. Which of them belong to the verb "to be"?

1. The day | was bright and clear.
2. The windows | were of clear glass like many others.
3. An old woman | came to the door.
4. The little boy | sat down by the brook.
5. His bare feet | made marks in the sand.
6. The little girl's hair | was golden like the windows.
7. I | shall be in the house in time for supper.
8. The way home | was long and dark.
9. At last the boy | saw his own house.
10. His mother and sister | came to meet him.

EXERCISE B.

Divide these sentences into subject and predicate. Underline the verb. Which of them belong to the verb "to be"?

1. Young puppies are always hungry.
2. My dog is a fox-terrier. His name is Rex.
3. Rats and gophers are afraid of him.
4. Rex will be one year old next week.
5. His mother has been with us for six years.
6. We have always been kind to our pets.
7. They never run away from us.
8. Dumb animals are often faithful friends.
9. My other pet is a brown rabbit.
10. It is very much afraid of Rex.

LESSON 39

ORAL PREPARATION FOR ESSAY WRITING

Essay Subject
DANIEL

The class may choose four outstanding incidents in Daniel's life and base the plan upon them. In the oral reproduction of the story, or its parts, emphasize the need of clear, distinct pronunciation, forceful speaking and confident appearance. Insist on the speaker stopping between sentences just as when reading. Discourage the constant use of "and" or "n" as a connective.

LESSON 40

PUNCTUATION—REVIEW

Rewrite the following exercises, putting in all necessary punctuation marks (including commas) and capitals. Divide into paragraphs if necessary.

EXERCISE A.

now iktomi stood beside it looking at the closed eyelids that did not quiver the least bit pressing his lips into straight lines and nodding his head slowly he bent over the wolf he held his ear close to the coyote's nose but not a breath of air stirred from it dead said he at last dead but not long since he ran over these plains see there in his paw is caught a fresh feather he is nice fat meat taking hold of the paw with the bird feather on it he exclaimed why he is still warm i'll carry him to my dwelling and have a roast for my evening meal ah-ha he laughed as he seized the coyote by its two fore paws and its two hind feet and swung him overhead across his shoulders the wolf was large and the teepee was far across the prairie iktomi trudged along with his burden smacking his hungry lips together he blinked his eyes hard to keep out the salty perspiration streaming down his face

EXERCISE B.

on this very same day the frog who lived in the pond decided to see more of the world good-by he said to mrs frog as he jumped from a lily-pad into the grass i am tired of sitting here in the sun thinking and blinking so i am going to kioto it so happened that the kioto frog and the frog from ozaka met on a hill halfway between the two cities good morning said one bowing his head to the ground three times good morning said the other also bowing respectfully then sank down in a shady spot for they were very tired and lame from trying to walk on their hind feet where are you going asked the ozaka frog this is a fine day for a journey i set out to see the great ocean at ozaka of which i have heard so often replied the frog who lived in the well but i am so tired that i think i shall be satisfied with looking at it from the top of this hill

LESSON 41

REPETITION OF WORDS—REVIEW

Rewrite the following sentences so as to avoid using the same word more than once in a sentence:

1. Many beautiful ladies were admiring the beautiful display of beautiful dresses.
2. The treasure hunters were seeking for treasure in a ship that had sunk with much treasure on board.
3. In the bitterness of his distress many thoughts passed through his mind.
4. The whistling of the train could not be heard because of the whistling of the wind through the trees.

5. Among other packages he carried a package of rice, but this package, rubbing against the other packages, soon broke open.
6. We were very comfortable in our comfortable camp though we missed many of the comforts of home.
7. The police caught the man with the stolen goods which he had stolen when the police were not looking.
8. The patient donkey travelled along patiently though the traveller was impatient to get to town.
9. The traders reach the trading post every spring in order to trade their furs with the Hudson's Bay Company.
10. The fort was well fortified with high fortifications.

LESSON 42

"LIE" AND "LAY"

The words **lie** and **lay** are frequently misused. **Lie** means to recline. **Lay** means to place. This word is followed by a noun (or pronoun) to tell what is being placed. The two words are frequently misused not only because they are alike in form, but also because "lay" sometimes means "to place" and sometimes "to recline". When followed by a noun (or pronoun) it means "to place"; when not followed by a noun (or pronoun) it means "to recline".

Thus—I lay the book (noun) on the table.
I lay (reclined) on the couch for an hour.

Consider the following:

He lies down—not—He lays down.
He will lie down—not—He will lay down.
He lay down—not—He laid down.
He has lain down—not—He has laid down.

EXERCISE A.

Select the proper form in brackets to complete the sentence:

1. (Lay, lie) the book on the table.
2. We will (lay, lie) on the grass next recess.
3. The man (lay, laid) the parcel on the table.

4. How long has he (laid, lain) there?
5. Make that dog (lay, lie) down.
6. He does not (lay, lie) comfortably on his bed.
7. Who is that (laying, lying) under the tree?
8. Please (lay, lie) the broom in the corner.
9. We have (lain, laid) the pencils on the desk.
10. Will you not (lay, lie) down for a while?

LESSON 43

Pronounce, find the meaning, and mark the accent. Use any ten words correctly in sentences:

(Selected from "In the Hall of Cedric the Saxon")

EXERCISE A.	EXERCISE B.	EXERCISE C.
disproportioned	domestics	sagacious
apartment	antique	physiognomy
vent	dignitaries	apprehensive
occasioned	canopy	truncheon
encrusting	tapestry	ecclesiastical
access	hospitality	dimensions
simplicity	tunic	studiously
piqued	minever	majestic
dais	perpendicularly	predominant
transversely	opulent	palmer
pilgrim	enveloped	accommodated
retinue	apologies	courtesy
ceremony	appropriated	trencher

LESSON 44

EXERCISE A.

Use each word correctly in a sentence:

bridle, bridal, seize, cease, accept, except, soar, sore, duel, dual, currant, current, ale, ail, inn.

EXERCISE B.

Use each word correctly in a sentence:

buoy, boy, soldier, shoulder, pier, peer, hymn, muscles, mussels, tide, tied, site, sight, mite, might.

LESSON 45

Correct the following errors:

1. It's them that broke the window.
2. We caught him laying in the fence corner.
3. It struck me on the train that we're awfully lucky to live in this town.
4. I guess maybe he won't come.
5. We had a perfectly terrible time making the road to town.
6. He rubs it into us every time we meet him.
7. How ever did you hit on that scheme?
8. I didn't like none of the other boys. They were too fresh.
9. He acts up like he was mad.
10. I always get along good with Sam.

LESSON 46

Write the following abbreviations in full and use each in a sentence:
M.A., Tex., I.O.U., D.D., Ste., Messrs., pron., K.C., Esq., Ans.

LESSON 47

ORAL PREPARATION FOR ESSAY WRITING

Essay Subject

ORIGINAL—A BOY SCOUT'S BUSY DAY

This is a good topic to correlate with Citizenship. Start with the motto of the Scouts. If possible, get the class to relate real incidents of everyday life in which Boy Scouts took part. Any noble act on the part of boys in the district will answer the purpose. For this essay avoid references to outstanding figures, but rather confine the discussion to incidents within the children's personal experience. The lesson should be assigned several days in advance that the children may be prepared to make original contributions.

Nature Study—Grade VI.

LESSON III.

THE SNOWSHOE RABBIT, OR WESTERN VARYING HARE

Rabbits are timid and inoffensive animals. They are attacked by many species of flesh-eating animals and birds, yet their numbers are not diminished, and they continue to live and multiply in spite of the rigors of climate and the attacks of numerous enemies. Our lessons in nature study should lead us to consider how each kind of living creature is fitted to live successfully in its natural surroundings. In the case of the animals we have selected for study we will be required to note their behavior as well as their peculiar form, color, structure, and other features. In every case we should look for the advantage to the animal of the particular form, feature or habit. While we are led to admire and to love the things we meet, we learn also not to be cruel or to wilfully destroy any living thing.

Our wild rabbits are perhaps the best fitted of all animals for withstanding the severities of a northern climate. Varieties of the Snowshoe rabbit are reported as numerous in Northern Greenland and in the Arctic Islands of Canada. These remain white the whole year round. Our variety is one of the commonest animals of the forest and prairie regions of Canada. All our wild animals change their hairy coat in spring and fall. In the case of the rabbit the winter coat is snowy white, and its furry covering is one of the best non-conductors of heat known. Two purposes are served by the white color of the winter coat. White surfaces do not radiate heat to the same extent as other colors, and many animals and birds of the North are thus protected from the cold. Then also, the white color gives protection by rendering the animal invisible. The summer coat of the varying hare is of a uniform brownish grey on the back and sides, and whitish below. It fits in well with the color of the natural surroundings, such as the old leaves covering the ground, the bark of trees, and the color of exposed soil. The animal instinctively takes advantage of this by sitting very still at the first suggestion of danger.

Rabbits are night wanderers and night feeders. They are thus protected somewhat from the coyotes, foxes, and larger hawks, and are in danger mainly from the fewer numbers of night prowlers such as the owl and the lynx. In summer their food consists of juicy herbs, leaves and grass; in winter they are obliged to eat buds and the bark of small saplings. How well the teeth and mouth-parts are formed for getting this kind of food and cutting it up fine ready for

swallowing! There are four teeth in front, two above and two below (leaving out of account two short ones above which are of no use) and in the back portion of the jaw are six above and five below, each tooth being ridged crosswise. The lower jaw works forward and backward over the upper, instead of sideways as in the case of most animals.

The senses of sight and hearing are especially keen. The eyes are prominent and placed on the sides of the head so that watch may be kept before as well as behind. The ears are long and may be moved separately to catch any sound. The nostrils are kept wobbling continually to receive any impressions the sense of smell may bring. Long bristles near the nose supply sensitive feelers.

A rabbit is in no sense a fighting animal, although when captured it will both bite and scratch. Its chief reliance for escape from its enemies is in its power of swift running with long jumps and quick change of direction. Observe carefully the tracks which the rabbit makes in the snow. The rear feet straddle the front ones and reach past them on the outside at each jump. The hind legs act in the manner of snowshoes to support the animal on the snow. They are also strongly built and are the motive force by which it is capable of out-running any of its enemies.

Rabbits do not burrow. They make nests or "forms" beneath a cover of grass or shrubbery in which the young are kept till they are able to look out for themselves. The young are nursed, or fed with their mother's milk and on this account they are classed as mammals.

In Southern Alberta the jack-rabbit is common, and its range is extending in recent years into the northern part of the province.

The animals of which we have been speaking are "hares" and the term "rabbit" is properly applied only to the European domestic species. We have used the term "rabbit" on account of its common use to designate all wild animals of this kind.

QUESTIONS

1. How can you tell from the tracks of a rabbit the direction he is travelling? Where are such tracks most common? When were the tracks made, by night or by day? How is it enabled to travel well in snow? Why is the flesh of the rabbit heaviest on the hind quarters?
2. What are the peculiarities of the ears, lips, eyes, and tail of the rabbit, and how are these of advantage to it?
3. What habits and features help to conceal the rabbit? Why is it difficult for a coyote to catch it? How do they sometimes succeed in doing it?
4. Write a short story or composition on "The Story of a Rabbit's Life" or "How I Hunt Rabbits and What I Learned About Them".

LESSON IV.

THE COYOTE

Mark Twain describes the coyote as "a long, slim, sick-and-sorry-looking skeleton; a living, breathing allegory of want". This may be true of the species found in the desert areas of the Western States. With us the coyote has all the appearance of being well-fed and prosperous. He need never go hungry, for there is an abundance of rabbits, mice, gophers, and birds of various kinds, and he is swift of foot, keen of sense, and cunning, beyond all other wild creatures.

Coyotes are relatives of the dog, the fox, and the wolf. They are lighter and more agile in their movements than the dog. They run with an easy lope, slowing down, when not pursued closely to a trot, and frequently stopping to take observations. One may notice by the track in the deep snow that in running he places three feet in a line with the fourth a little to one side. Often there is a mark where his tail touches the snow between each lope.

The coyote is a great hunter; meadow mice, rabbits, gophers, frogs, snakes, grasshoppers, and birds are his principal food. His reputation with the farmer is very bad, for once having had a taste of barnyard poultry, he lurks about the yard seeking for more. A single coyote may thus become a very destructive pest. The weapons he uses for battle and for securing his prey are his "tushes" the four long, sharp teeth in the front of his mouth which pass each other when the teeth are clenched giving a strong, four-fold hold on his victim. His fore-paws are brought into play when small birds and animals are suddenly pounced upon. The back teeth or molars are not adapted for grinding the food, but clench in the manner of ~~scissors~~ shears for the purpose of cutting flesh into smaller portions.

The color of the coyote is a neutral grey which blends well with the general color of the prairie and serves the purpose well of concealing him while he is stalking his prey. His padded feet and springy step enable him to travel with least possible noise. His powers of smell, sight, and hearing are wonderfully keen in spying the presence or approach of man, or in locating the living things which may serve as his food. Cunning and health are displayed in his slanting furtive eyes, his erect ears, and his pointed nose. We should mention also the splendid coat of fur which renders him indifferent to the cold. In the coldest weather the packs gather on the ice in the middle of a lake or in an open space, where they bark, howl, and play as if they enjoy the cold.

QUESTIONS

1. Describe the track of the coyote in the snow. Why are the tracks most frequent around sloughs? How would you distinguish it from a dog's track?

2. Where does the coyote make its home? What is interesting about the young? Why are coyotes classed as mammals? What is their chief food? In what ways may they be considered beneficial and in what way harmful? Should they be utterly killed off?
3. Describe the bark of the coyote? What is the meaning he wishes to convey by it?
4. How has nature provided the coyote with means of concealment? With means of attacking enemies? Of escaping from enemies? Of finding food? Of withstanding cold?
5. Tell a story of how men hunt coyotes, or of things you have heard regarding their cunning or boldness.

THE RED SQUIRREL

In a grove of pine or spruce trees one is almost certain to meet with one or more of these lively little tree-climbers. They have an impudent fashion of barking at us or at an intruding dog from the lower limbs of a tree, and at a gesture from us of hiding behind the trunk still scolding noisily. Let us consider briefly how the squirrel is suited by nature for the life he leads. His furry coat keeps him warm and his long bushy tail wrapped close about him also helps in this. His food is chiefly the seeds of the pine or spruce which he secures by biting into the cones with his sharp chisel-like teeth, while the cone is held in his fore-paws. In certain seasons he eats wild fruit and the eggs of birds. His eyes are set out prominently in his head and so he is able to see in all directions. The muscles of the hind legs are stronger than those of the fore legs, and he is enabled to sit erect when eating or to look about him. The finger-like toes are adapted for clinging to the rough bark of trees when climbing.

We have selected three animals for study this month which boys and girls may readily meet almost anywhere in Alberta, but which are not described in most of the nature-study books. Children should be glad to write about the animals they meet with in the fields or woods telling how the form, color, habits, and so on, are of advantage to the animal. It should be noted that very few wild creatures are fitted by nature to understand the danger to them of catapults or guns, although they have learned to be particularly afraid of man. To use these weapons is really taking an unfair advantage of the little wild creatures. We suggest to boys particularly that without killing them they make a close study of the following, which are all found in Alberta: The white-footed or deer mouse, the field mouse, the gopher, the weasel, the flying squirrel, the badger.

QUESTIONS

1. Why does the red squirrel stop frequently and sit up when it goes from place to place? How does it feed? What is its usual food in Alberta? Where do we find

squirrels usually? How are they enabled to bite hard substances? Why must they do so continually?

2. Why is the squirrel provided with erect ears? With long, jointed toes, with bulging eye-balls, with a long bushy tail?
3. Of what value to the skunk are the white stripes on his back? Why is a skunk not timid like other animals?
4. Why is the weasel white in winter? Why is the tip of the tail black even in winter? Why is its body long and slender?
5. Tell a story of something amusing or interesting about a wild animal of Alberta (bat, weasel, mink, badger, etc.)

History and Civics—Grade VII.

R. J. Scott, Principal of Mackay Avenue School, Edmonton

LESSON V.

THE DESPOTIC POWER OF THE TUDORS

1. **The Character of the Tudor Sovereigns.** — The beginning of the sixteenth century was a time of unrest. The Reformation was under way, and the feud of the Lancastrian and Yorkist which had caused the Wars of the Roses was still alive. It was fortunate under these circumstances that the government of England fell into the hands of capable and strong rulers such as the Tudors were. They chose capable men as their counsellors, they were sincerely patriotic and desirous of seeing England assume a commanding place among the nations, and they were disposed to strengthen the authority of the crown and restrict that of the nobles. Parliament was called together frequently, but its measures were largely those proposed to it by the sovereign, and it did little else than carry out what the king wished.

2. **Decay of the Feudal Baronage.**—From the earliest times there had been in England certain land-holders whose title to their estates depended on their swearing fealty to the king and paying him certain fees, and who also were served in similar manner by those to whom their lands were sub-let. In each case the right to the lands passed, on the death of the holder, to the next heir. A system of this kind is known as feudalism. The great feudal barons were difficult to keep in control. In 1215 they forced King John to sign Magna Charta. In the next reign they defeated and took prisoner the king, Henry III. The Wars of the Roses which lasted from 1454 to 1485 was largely a struggle between rival factions among the nobles. Due to several causes the feudal baronage was weakened in numbers and influence about the time of the accession of Henry VII. It was on this account that the kings of the Tudor line were able to have pretty much their own way, and were in fact despotic. The causes of the disappearance of the feudal barons were chiefly the following:

(a) In the Wars of the Roses many were killed, and others were exiled and their lands seized through their having supported the losing side.

(b) The growing power of the towns and the influence of the merchant classes threw the nobility into a position of less importance than heretofore.

(c) The kings employed professional armies supplied with new weapons using gunpowder. Against these the armor of knights and walled castles were of little avail.

3. **Henry VII. and the Royal Exactions.**—Henry found it difficult to raise the money necessary to carry on the government of the country. His claim to the throne was not a strong one by birth, and it was necessary for him to be cautious in the matter of levying taxes. Two devices were used by him, by which he made the rich and the nobility contribute funds to his treasury. These were heavy fines levied on those who were found guilty under the laws forbidding liveries and maintenance, and benevolences, or forced gifts from wealthy men. The Statute of Liveries and Maintenance of 1487 forbade the custom of the nobles of keeping large numbers of men in livery. Often these men were criminals who were protected from prosecution by the protection of their patron. This banding together of men under the banner of a noble and their defiance of the courts of law was an evil which Henry VII. stamped out. Benevolences or forced gifts had been a customary means of raising money in previous reigns. Merchants and men of wealth had been glad at first to come to the king's aid in order that there might be settled government, but although in peaceful times the need was not so apparent, Henry's agents found means of exacting the so-called gifts.

4. **The Star Chamber Court.**—Justice and the enforcement of the laws had failed during the disorders of the Wars of the Roses. The local nobility set at nought the ordinary magistrates and openly abetted and protected criminals and debt-evaders by the custom known as maintenance. Now Henry VII.'s parliament gave him power to try powerful offenders before a committee of the Privy Council. This is the famous Star Chamber which under the Tudors served a very good purpose, but later under the Stuarts became an instrument of the king's tyranny. The court was abolished by the Long Parliament in 1641.

5. **The Sovereign Becomes Head of the Church.**—The definite break with Rome and separation of England from the Catholic Church occurred in 1535. In that year Parliament, carrying out the wishes of Henry VIII., declared the King to be the Supreme Head of the Church in England. Henry's determination to sever relations with Rome arose out of the refusal of the Pope to grant the divorce of Henry from Queen Katherine. Henry was able to proceed with boldness and success because of the religious revolt that was taking place in Germany which we know as the Reformation. Martin Luther, a German monk, attacked the teachings of the Church, and soon converted a large part of Germany to his views. In England, after the passing of the Act of Supremacy in 1535, there was no desire on the part of the king to break further away from the Catholic teaching and form of church service. When Mary succeeded to the throne in 1553 the anti-papal laws of Henry VIII.'s reign were repealed and the country became Catholic again. Finally under Elizabeth the church question was settled by

setting up the Anglican form of worship and church government and enforcing the use of the Prayer Book by law, with the sovereign supreme in church affairs.

6. **The Suppression of the Monasteries.** — The regular clergy did not make strong objection to the break with Rome, but the abbots, monks, and others associated with the monasteries remained loyal to the Pope. It was determined by Henry and his minister Cromwell that the monasteries should be dissolved and their property seized. There could be many good reasons given why this should be done. The estates held by them were enormous in extent. A few monasteries were shown to be disorderly resorts. While they possessed great libraries the monks did little to educate the masses. Their houses were open to the wayfarer and the poor, but for this they were blamed as being promoters of idleness.

The men of the northern counties rose in protest against the seizure of the abbeys in a rebellion known as the Pilgrimage of Grace, but they were repressed with great severity, and the seizure of the lands and wealth was carried to completion. The lands were sold on easy terms to the nobility and while pensions were paid to some of the higher abbots, the larger share of money went into the royal treasury, part being used for the building of forts on the southern coast.

7. **Monopolies in Trade.**—Monopolies are special privileges granted to a certain individual or company of the right to trade in a certain commodity or to manufacture it, all other persons being forbidden to do so. Monopolies of various kinds were in control of much of the commerce of Tudor times. The Merchants of the Staple, for example, had exclusive right to trade in certain classes of goods. Being in control of the world supply of a given staple they were able to make treaties with foreign countries and secure favorable terms of trade. Another form of monopoly was that granted by kings to private individuals. This was regarded as necessary in order to establish an industry where the competition of free traders might destroy it. The effect, of course, was to raise the price of the article and to make the possessor of the rights wealthy. Elizabeth's Parliament in the later years of her reign made forcible protests against certain monopolies of the trade in salt, leather, gold wire, and the like, granted to favorites. In the reign of James I. such grants by the king were declared illegal.

QUESTIONS

1. What disturbed the peace of England in Tudor times? What good qualities had the Tudor sovereigns? What part did parliament take in the government?
2. Describe the system of feudalism. Show that it weakened the king's authority. What caused the decay of feudalism in England?
3. Describe two means of filling his treasury adopted by Henry VII. What was the Star Chamber? How did it help to bring orderly government?
4. What was the effect of the Act of Supremacy? Why was it passed? What was Henry VIII.'s reason for the break with the Pope? What was the system of church government he desired to set up? Write a note on Luther.
5. Why were the monasteries dissolved by Henry VIII.? What good service had they done in their time? What reasons can be given in favor of their seizure? What became of the lands and treasure?
6. What are monopolies? Describe two kinds prevailing in Tudor times. What was the natural effect of them? When and how was the evil abolished?

LESSON VI.

TUDOR ENGLAND (Continued)
ECONOMIC AND SOCIAL CHANGES

1. **Enclosures.**—Previous to this time farming had been carried on merely as a means of gaining a living and with little thought of making profits. There now was a good market for wool in Flanders where the Flemish weavers regarded the English product as of the best quality. Landowners found it profitable to turn tilled land into pasturage

for sheep, and since this was done on a large scale all over the country it resulted in important changes in rural conditions. The mediaeval village consisted of open fields cut up into strips of an acre or half an acre separated by balks of turf, along with an area of common land which was permanently pasture for the stock of the whole community. As time went on the lords of the manor managed to get control of the manorial estate in their own name and turn it into pasture. Tenants were evicted on one excuse or another, often illegally, for the forces of the law were usually on the side of the upper classes. The whole process is known as "enclosure" and at this time the enclosed land was as a rule turned into sheep pasture. Fewer laborers were now employed and owing to this and the improved market for wool the profits of the land-owner were great.

2. **Unemployment as a Result of the Enclosures.**—With the decay of the manorial system and the adoption of pasturage in the place of tillage, the rural population in large numbers were left without employment. Country laborers were not welcome in the city for the system of guilds and apprentices was designed to exclude new-comers, and only those apprenticed from earliest boyhood were permitted to practice a trade. Moreover owing to the lessened amount of land under cultivation, prices of food rose. Distressful conditions of this kind resulted in an increase in the numbers of paupers and beggars, which became one of the most serious problems with which the Tudor statesmen had to deal.

3. **Manufacturing in the Sixteenth Century.** — A certain amount of home manufacturing was carried on in the early English communities. Tanning, weaving, brewing malt, pottery making, metal-working, and similar necessary trades supplied to a large extent the articles of daily use. There were practically no exports of such products. Weaving was the first industry to develop on an extensive scale. Weavers from Flanders came to England at various times in the Norman and Plantagenet periods. In Elizabeth's reign refugees from the persecutions in France and Flanders brought their looms and settled on the east coast. Lace manufacture was set up in the towns of the Midlands and Devon and the arts of cutlery, pottery, hat-making and clock-making in other centres. By the end of the Tudor period England was no longer an importer of such goods, and scarcely any wool was exported except in the form of cloth.

Spinning and weaving were done in the homes of the people. Whole families worked hard at the looms in cottages of the lower classes both in the towns and country. Sale of the product was made to traders or middlemen who found a market for it, and took their tribute in profits. Thus industrial conditions had changed since the time of the mediaeval gilds when makers were also sellers.

4. **The Mercantile System.**—This is the name applied to the policy of the Tudor Sovereigns whereby they sought to give encouragement to English industries. Their aim was to render England completely independent of the foreigner by producing all she required at home. To bring this about their policy was (1) To build a strong English fleet, (2) To increase the supplies of food produced yearly, (3) To provide employment for all, (4) To keep an ample supply of gold within the country. These aims were never realized in full, but there developed as a result of their effort a strong patriotic spirit which raised England to a commanding position among the nations.

The building of a royal navy was the pet scheme of Henry VIII. He spent some of the plunder of the abbeys in building ships. He imported Italian laborers to show the English how to build ships. The defeat of the Armada in 1588 must be credited in some degree to Henry's policy.

Parliament taxed foreign corn entering England in order to encourage English farmers to grow more of it. The protection afforded by this tax tended to keep up the price of this article of food and made it worthwhile for landholders to grow wheat in spite of the profits from sheep-farming.

Laws were made forbidding the importation of certain articles of manufacture which it was thought could be made in England. An embargo was placed also on raw materials whenever it was considered that English workers were capable of working them up into finished products. The aim in all this was to provide work in the country. Even foreign craftsmen were encouraged to settle in the country if they brought knowledge of a trade which Englishmen might learn.

The fourth aim of the Tudors in their mercantile system was to bring gold to England, the supposition being that to do this would bring prosperity. Laws were passed against the export of gold, but these were of no avail, for it

was easily smuggled out of the country. Then it was proposed to encourage exports except raw materials and reduce imports. This would leave a balance of trade favorable to England. The wisdom of such means as were tried in the Mercantile System for bringing good times to a country is still a matter about which there is difference of opinion.

QUESTIONS

1. What is meant by the term "enclosures"? Why was it the desire of land-owners to enclose land? Describe the manorial system before this change. Tell how the consolidation of the estates was brought about.
2. Account for the distress which followed the closing up of the manorial estates. Why was there a rise in prices? What evil taxed the wisdom of the Elizabethan statesmen? By reference to some text tell how it was dealt with.
3. Describe the early English industries. What was the influence of foreign craftsmen on English industry? What industries grew up under Elizabeth? How were markets obtained?
4. What are the four points in the Mercantile System of the Tudors? What was the chief aim of this policy? Describe how each aim was carried out. What effect on the spirit of the people was due to this policy?

Agriculture A—Grades VII and VIII

THE PARTS OF A PLANT AND THEIR FUNCTIONS

A.—THE ROOT

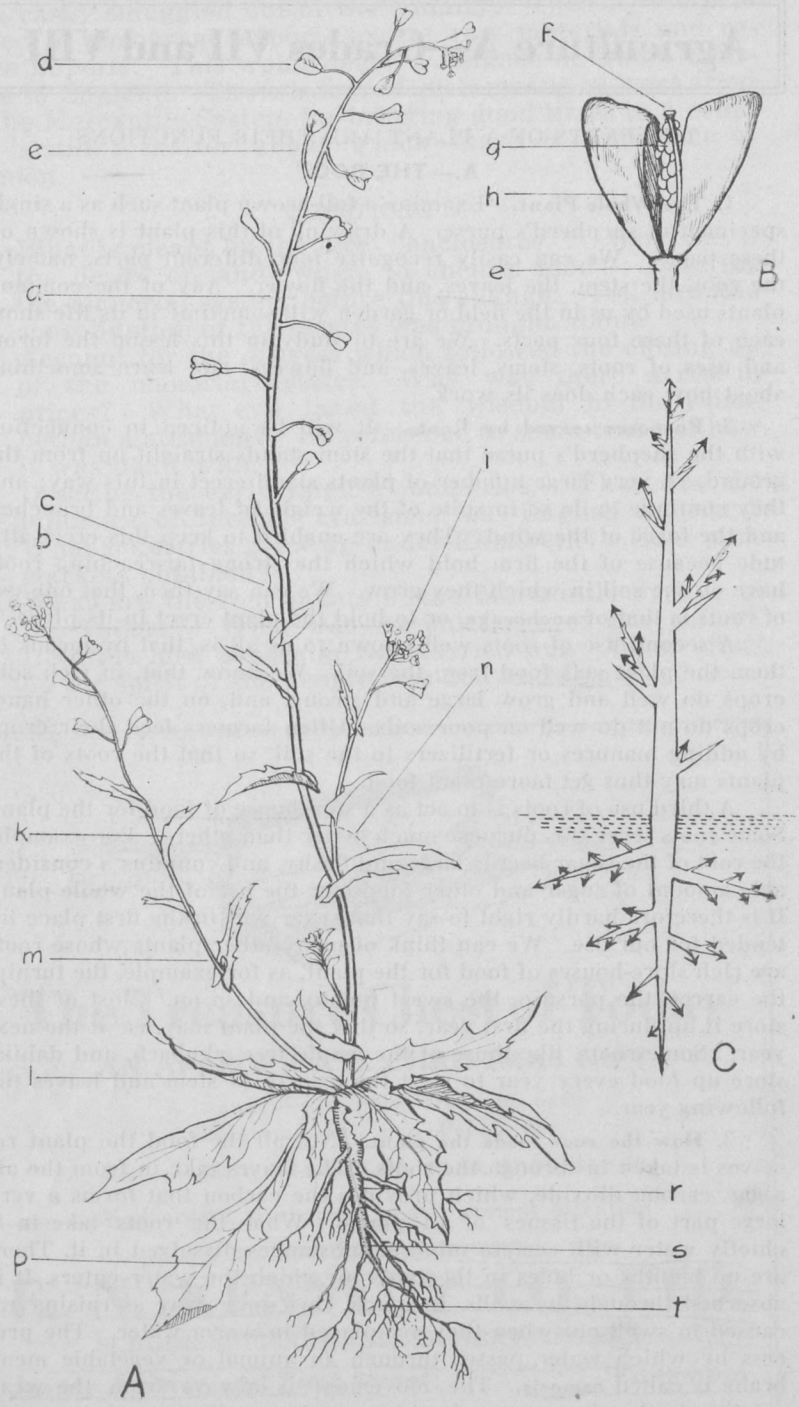
1. **The Whole Plant.**—Examine a full-grown plant such as a single specimen of shepherd's purse. A drawing of this plant is shown on these pages. We can easily recognize four different parts, namely, the root, the stem, the leaves, and the flower. Any of the common plants used by us in the field or garden will sometime in its life show each of these four parts. We are to study in this lesson the forms and uses of roots, stems, leaves, and flowers, and learn something about how each does its work.

2. **Purposes served by Roots.**—It will be noticed in connection with the shepherd's purse that the stem stands straight up from the ground. A very large number of plants stand erect in this way; and they continue to do so in spite of the weight of leaves and branches, and the force of the wind. They are enabled to keep this erect attitude because of the firm hold which the strong far-reaching roots have on the soil in which they grow. We can say then, that one use of roots is that of **anchorage**, or to hold the plant erect in its place.

A second use of roots well known to us all is, that by means of them the plant gets food from the soil. We know that, in rich soil, crops do well and grow large and strong, and, on the other hand, crops do not do well on poor soils. Often farmers feed their crops by adding manures or fertilizers to the soil, so that the roots of the plants may thus get more plant food.

A third use of roots is to act as a storehouse of food for the plant. Some roots serve this purpose much better than others. For example, the root of the sugar beet is large and fleshy, and contains a considerable amount of sugar and other foods for the use of the whole plant. It is therefore hardly right to say that sugar was in the first place intended for our use. We can think of many other plants whose roots are rich store-houses of food for the plant, as for example, the turnip, the carrot, the parsnip, the sweet potato, and so on. Most of these store it up during the first year, so that the plant may use it the next year. Some roots, like those of the maple tree, rhubarb, and dahlia, store up food every year to start the growth of stem and leaves the following year.

3. **How the root feeds the plant.**—Not all the food the plant receives is taken in through the roots. The leaves take in from the air a gas, carbon dioxide, which provides the carbon that forms a very large part of the tissues of all plants. What the roots take in is chiefly water with certain mineral substances dissolved in it. There are no mouths or holes in the roots by which the water enters. It is absorbed through the walls in much the same way as raisins are caused to swell out when they are placed in warm water. The process by which water passes through an animal or vegetable membrane is called **osmosis**. The movement is always from the weak solution to the strong one. In the case of roots in the soil, the weak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mineral solution is the soil water, the stronger one is the fluids in the cells of the roots.

4. **Root-Hairs.**—Sprout some seeds of corn or wheat between damp blotters or layers of cheese-cloth. After the root has become an inch or more in length, close examination of it will show that the root is covered, a little distance back from the tip, with a dense wooly or fuzzy growth, like tiny hairs. These are root hairs. They never grow any larger or develop into real roots. They drop off when the root-tip presses forward further into the soil. Meanwhile other root-hairs grow and wherever the tip of the root is, but always a short distance back from the point.

In the absorption of water from the soil the root-hairs of plants play the chief part. Owing to their delicate structure and their large surface area, water passes more freely through them from the soil to the root than through any other part of the root system. They cling closely to the fine particles of soil, and are thus in touch with the film of moisture which surrounds the fine grains in all damp soil.

5. **The Root-Cap.**—Look closely at the drawing of a magnified cross-section of a root-tip shown in the accompanying illustration. The little squares or rectangles filling up the body of the root are the cells of the root as they are seen by means of a powerful microscope. Those near the tip of the root, it will be noticed, are flattened out and are more like scales or scurf. They are harder than the rest and form a sort of thimble, or, as it is called a "cap", which protects the delicate cells as they are pushed through the soil by the growth and lengthening of the root.

6. **The Root System.**—The entire mass of roots of any plant is called its root-system. Usually the larger branches of the root system reach out in all directions from a point just beneath the ground. They divide off into branches, as a rule, and the branching is repeated till the very finest root-fibres are reached. Near the tip of these there are root-hairs, mentioned above, which are the feeding organs of the plant. The larger branches of the root we may call primary roots, the branches of these, secondary roots; the finest branches may be termed rootlets; and growing on these, near the tip, as we have seen, are the root-hairs. Thus there is a certain resemblance between the root system and the branches of the stem above ground, but the roots are more irregular and crooked, and probably in most cases reach out farther and are more numerous.

7. **Forms of Roots.**—The figures on the accompanying plate will show clearly the different kinds of roots commonly met with. Wheat, oats, corn, potatoes and onions provide examples of fibrous roots. The

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DESCRIPTION OF PLATE I.

A.—Plant of Shepherd's-purse, showing the main parts of root and shoot systems.
(a) axis of inflorescence; (b) node; (c) internode; (d) fruit; (e) pedicel; (f) remnant of stigma; (g) seeds; (h) valve; (i) inflorescence; (k) cauline leaf; (l) radical leaf; (m) axillary bud; (n) leaf axil; (p) mid-rib; (r) primary root; (s) secondary root; (t) tertiary rootlets.

B.—Fruit of Shepherd's-purse, showing the mode of dehiscence.

C.—Diagram showing the growing-points (marked with arrow-heads) of a typical flowering plant.

THE PERFECT FOOD

(Contributed by the Edmonton City Dairy)

Jean was a little girl eleven years of age and fifty-one pounds in weight. The school nurse brought a doctor to see her because she was so small and thin and pale. The doctor wrote a prescription for Jean, the nurse saw that the medicine was administered, and within a week Jean weighed fifty-seven pounds. The prescription read, "Three pints of milk per day until well, and one quart per day thereafter."

You see, Jean's body, like that of every other small person, needs four kinds of foods beside water. They are: protein for muscle, fat for heat, carbohydrates for energy, and mineral matter for bone-substance. Some foods contain a great deal of one of these substances and very little of the others. Meat is rich in protein, potatoes in carbohydrates, and butter, of course, in fat; leaf vegetables contain much mineral matter. Milk, on the other hand, contains the correct proportions of all four.

Every hundred pounds of cow's milk contains, on the average: 87 pounds of water, 4 pounds of fat, 3¼ pounds of protein, 5 pounds of carbohydrates, ¾ pounds of mineral matter. It will be seen that diets lacking any food may be supplied easily by quantities of milk. That is why the doctor prescribed so simple a medicine for Jean, and why it had so immediate and beneficial a result.

There is another reason for the doctor's prescription. Milk is cheap. By a careful estimate, it has been found that one quart of milk gives as much energy as fifteen ounces of steak, or fifteen ounces of fowl, or nine eggs. In other words, when milk is twelve cents a quart, sirloin steak should be seventeen cents a pound and eggs sixteen cents a dozen, if the milk, meat and eggs are to supply energy at equal cost.

Healthy, happy boys and girls, morning, noon and night, drink milk.

branches composing the root system of such plants are slender and nearly equal. The shepherd's purse illustrates the tap-root. Here there is one main root from which side roots branch out. Alfalfa roots are of this kind, and also those of the dandelion, red clover, cabbage and many others. Fleshy tap roots are exemplified by the radish, turnip, carrot, and parsnip. Such roots are of value as food for human beings and for farm stock. They are store-houses of food for the plant also. (See Sec. 2). To grow roots of this kind successfully, a soil that is plowed deep is required in order that the root may have room to grow to the greatest possible size and depth.

QUESTIONS

1. How do roots enable plants to stand up straight? What are some of the most remarkable examples of this? Name some whose roots do not prop the stem up.
2. In what two ways do plants receive food? How can we feed plants? In what form is the food taken up?
3. Name five plants the roots of which contain food material. For what purpose is this food stored in the root? Describe the "life-cycle" or history of a beet or turnip from the time seed is sowed till it produces seed.
4. What three purposes are served by roots?
5. What is osmosis? Show how it explains the means by which soil materials enter the plant body.
6. Draw a seedling showing the main roots and the root hairs. Where are these latter placed? What is the purpose they serve? Do they ever become big roots? How are they well suited for taking up soil-water?
7. Sketch a root-tip so as to show the nature of the root-cap. What is the use of the root-cap?
8. Make a drawing of the root system of an onion, or of a common weed.
9. Give examples (5 each) of fibrous roots, of fleshy roots, and of tap-roots. Describe each.

B.—THE STEM

1. **What the Stem is.**—If we examine again a full-grown specimen of the shepherd's-purse, or the drawing of this plant shown here, we shall see that the portion above ground is rather distinctly marked off from the root which develops underground. It is green in color whereas the root is brown or whitish, and it bears branches and leaves. At the top are borne the flowers and seed pods. We may speak of the central stalk and its branches as the stem of the plant. Some plants appear to have no stems, but such so-called "stemless plants" have in reality short stems which we can recognize as that part of the plant where the leaves are attached.

2. **The Purpose Served by the Stem.**—Plants reach upward to gain access to air and sunlight. Stems of trees, weeds, and other plants are usually straightest and tallest wherever they are crowded closely by others of their own size, the reason being that sunlight is essential for their best development. The chief use of the stem is therefore to hold the leaves up to the light and to give them sufficient exposure to the sun for their best growth.

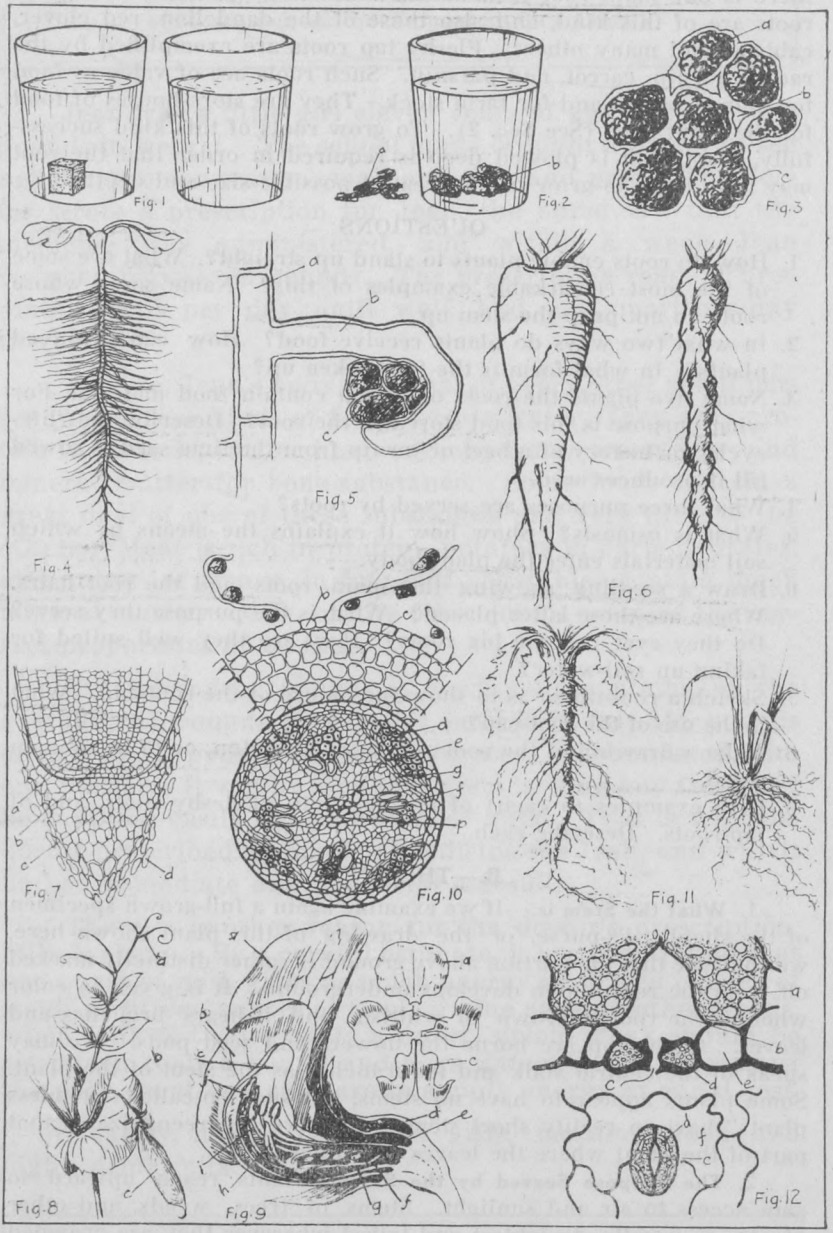


Fig. 1
Fig. 2
Fig. 3
Fig. 4
Fig. 5
Fig. 6
Fig. 7
Fig. 10
Fig. 11
Fig. 8
Fig. 9
Fig. 12

It has already been noticed that the flowers of plants are often near the top of the stem. One reason for this is to secure fertilization of the flowers by the bees or by the winds in order that fruit may be certain to form in the flower-head. This, then, is a second use of the stem to the plant.

We know that farmers cut the stems of grass, corn, grain, sunflowers and other plants, and use them as fodder for animals. It is thus shown that stems are stored with food. This in the first place is meant for the use of the various parts of the plant to furnish materials for their growth, but animals and man take advantage of this to secure food for themselves. The stem is also the channel through which plant food reaches te leaves from the roots and the soil.

3. **Stems are of Many Forms.**—Those to which reference has been made are erect, as for example, the shepherd's purse. A large number of instances of such stems could be named. There are, however, many other forms; in fact, every plant has its own "habit" of growth, that is, its particular shape, size, height, or position of its stem. Some are climbing, such as the hop and ivy, some creep on the ground, as the strawberry; some rise to several feet and then bend over, as the raspberry, and so the list could be continued indefinitely.

An interesting form of stem is the "tuber", an example of which is the potato. The tuber is a store-house of food for the next year's growth. The "eyes" of the potato are buds, the little scales above the eyes correspond to the leaves, and the skin represents the bark or outer covering.

4. **Two Kinds of Stems According to Structure.**—There are two main types of stems in this respect. Examples of the first are the stalks of Indian corn, grasses, lilies, wheat, etc. Their stem has no true bark, and the strands of fibre are scattered through the stem. If a cornstalk is broken in two, the fibres may easily be seen running lengthwise of the stem.

The second type of stem is that in which the wood lies in rings, and which has a bark or epidermis on the outside. Examples are the poplar, willow, rose, turnip, pea, bean, etc. In the case of trees whose stems are of this type, every ring represents a year of growth, and therefore the age of a tree may be determined by counting the number of rings in the wood.

Fig. 1.—Sugar dissolves in water. Fig. 2.—(a) raisins before being immersed in water, (b) raisins after immersion. Fig 3—(a) soil particle, (b) air space, (c) water film. Fig. 4—Radish seedling showing root-hairs. Fig. 5—(a) cell in epidermis, (b) root-hair, (c) soil particles. Fig. 6—Root of carrot. Fig. 7—Root cap (a) and (b) dividing cells, (c) dead cells forming the root cap. Fig. 8—Garden Pea plant, (a) tendril, (b) stipule, (c) pod (legume). Fig. 9—Cross-section of flower of garden pea, (a) standard, (b) wings, (c) keel, (d) sepal, (e and f) ovary, (g) ovule, (h) stigma, (i) filament, (j) anther. Fig. 10—Cross-section of young root, (a) root-hair, (b) epidermis, (c) contex, (d) endodermis, (e) plaem, (f) ploem parenchyma, (f) vascular bundles, (p) pith. Fig. 11—Root of Dandelion (left), root of Grass Plant (right). Fig. 12—Section of leaf, (a) merophyll cell, (b) intercellular air space, (c) pone, (d) guard cell, (e) cell of lower epidermis.

5. **Structure of the Stem.**—If a piece of the stem of a small poplar tree is taken, five regions or divisions of the wood can be noted. They are as follows:

(a) The pith in the centre. It is filled with white spongy tissue when the tree is young. It is plainly seen by cutting through a raspberry cane.

(b) The heartwood. This is the dark-colored wood in the centre consisting of dead cells which serve to give strength to the stem.

(c) **The cambium layer.** This is a circle of live tissue forming the outside ring of wood. It is here that the growth in the thickness of the stem takes place.

(d) **The bast fibres.** These line the inside of the bark, and they consist also of living tissues which contain tubes for conveying food materials prepared in the leaf to various parts of the plant, where growth is taking place.

(e) The bark of trees and shrubs or the epidermis found on most plants consists of corky tissue, which prevents exposure of the living cambium and bast to the drying action of the sun and air.

QUESTIONS

1. How is the stem of a plant distinct in appearance from the root?
2. Give three reasons why plants are provided with stems.
3. How would you locate the position of the stem of such plants as the turnip or dandelion?
4. Name plants on the farm the stems of which are of the forms given:
   (a) Erect and unbranched.
   (b) Erect and branching.
   (c) Climbing by tendrils.
   (d) Creeping.
   (e) Twining.
   (f) Underground as well as above ground.
5. Distinguish potato tubers from potato roots. What is the natural use of the tuber to the potato plant?
6. Distinguish the structure of the stems of **corn** and **poplar tree.**
7. Name five plants of each type described in Question 6.
8. Draw a cross-section of the stem of a tree. Mark in the five divisions discussed in the lesson.

C.—THE LEAF

1. **The Color of the Leaf.**—Almost all leaves are green. Certain ornamental plants, it is true, have leaves that are wholly or partly of some other color, as for example, ribbon grass, coleus, begonia, and others. Green, however, is the prevailing color. There is a close relation between the health of a plant and the greenness of its leaves. Plants kept in a dark cellar grow spindly, and their tissues weak and watery, while their color becomes a pale yellow. Diseased plants, or those growing in wet ground, are also weak, and assume a yellowish color. We shall see that the green coloring matter of the leaf has much to do with the nourishment of the plant, and that it is developed in the leaf by the action of sunlight.

2. **Variety of Form and Arrangement.**—Every tree and herb has its own leaf form by which we may at once recognize it. Some leaves

are needle-like such as those of the pine and spruce; some are exceedingly large and broad, as those of the rhubarb; the grasses have long narrow leaves; the leaves of the cactus are reduced to fine spines or hairs owing to their desert surroundings. Then again there is a wide variety in the arrangement of leaves. Some are opposite each other on the stem, as in the high-bush cranberry and maple; others are alternate, as in the poplar and the pea-vine. Some leaves are on long stems or petioles in order to reach the light, while others are sessile or without leaf stems. Leaf exposure to sunlight is always provided in some way for all the leaves on a plant, but exposure to the strong noon-day sun is avoided by the angle at which the leaf is set, or by overlapping from above by other leaves.

3. **The Parts of a Leaf.**—Let the student bring into the class a leaf of some house-plant such as a begonia or geranium. If the blade is held up to the light it will be noted that there is a fine net-work of lines running through it. These are the veins. The heavy ridge running down the centre is the mid-rib. Perhaps in the leaf the student is examining there are several large veins. The one running out to the tip is, in this case, the mid-rib. Two purposes are served by the larger veins: (1) They act as a support to stiffen the leaf. (2) They are the vessels which come up all the way from the root in which is carried the soil water containing plant-food. The veins branch out into finer and finer divisions, thus spreading the food and moisture very evenly throughout the leaf.

4. **The Structure of the Leaf as Seen Under the Microscope.**—For the purpose of examining a cross-section of a leaf in order to see the different kinds of cells of which it is composed a compound microscope of considerable power must be used. Even with this, considerable skill is needed to get a clearly defined image. The student would do well to study and copy the accompanying diagram of a magnified slice of a leaf. He will notice that there are four distinct layers from the top to the bottom surfaces. The upper and lower rows of cells are known as the epidermis. On examining the specimens of leaf brought to class, it will be found that the lower surface is rougher than the upper, strongly marked with the veining, and perhaps bristly or hairy. Then turning again to the diagram, there will be noticed two intermediate layers of cells. The upper one, next to the

upper epidermis, consists of cells standing endwise to the leaf surface. Such an arrangement prevents excessive evaporation, and the cells, from their resemblance to the walls of a fort, are called "palisade" cells. Below the palisade cells are large, irregular, spongy cells known as "mesopyll," a word meaning "the middle of the leaf". Two other things are to be noted in the diagram: First, the little dots of leaf-green or chloropyll, which are crowded thickly in the palisade cells, and less thickly in the cells of the mesophyll; second, the air spaces among all the cells in the middle of the leaf. The use of these will be shown presently.

5. **Carbon, a Constituent of all Plants.**—When a piece of a plant is burned a mass of charcoal is formed almost as large as the body of the plant. This charcoal is almost pure carbon. When the carbon is burned it goes off into the air as a gas known as Carbon Dioxide, CO_2. About half of the dry substance of a tree is carbon; the remainder is mineral matter, most of which remains as ash when the plant is completely burned.

6. **Plants Obtain Their Carbon from the Air.**—The gas carbon dioxide which is a compound of carbon and oxygen, forms a very small fraction of the air. If it were increased very much the effect would be injurious to both plant and animal life. Notwithstanding the smallness of the quantity, the carbon-dioxide of the air supplies all the carbon which is found in the bodies of plants and animals. How are plants enabled to make use of this gas? The air readily enters the leaf tissues filling up the air spaces which we noticed among the cells. There the carbon dioxide is taken in by the leaf and joined with the water which comes up from the root through the vessels and leaf veins. The combining of these two, forms starch in the leaf. The starch is changed to sugar and, in this form, can circulate to all parts of the plant to supply the materials necessary for growth. Thus the woody structure of plants, consisting of carbon largely, is formed out of the starch manufactured in the leaf. Soil-water and carbon-dioxide are the materials out of which starch is made.

Certain openings in the under-side of the leaf known as stomates admit the air to the air-spaces among the cells and also permit its

return to the outer air. This process is known as **Respiration.** By this means leaves return much oxygen to the air.

7. **Transpiration.**—Plants take up all their moisture through the roots. This moisture serves several purposes. The lining cells of the plant contain fluids which are largely water. The manufacture of starch in the leaf, as we have seen, makes use of water. To obtain even a small amount of mineral food from the soil a large amount of water must be taken up. Owing to this last circumstance, plants absorb a great deal of water from the soil which they cannot use. A full grown sunflower will give off a quart of water per day. This loss of water takes place chiefly through openings in the underside of the leaves which are known as stomates, and the process is termed "transpiration". If transpiration is great as on hot, sunny days, the plant wilts. Injury to the roots or anything which cuts off the supply of moisture using from the roots such as injuries to the stem, will result in transpiration exceeding the supply of water and cause the leaves to wilt.

8. **Experiment to Illustrate Transpiration.**—That plants lose moisture by evaporation through the stem or leaf may be shown in several ways. The following are suggestions for experiments to illustrate transpiration:—

(1) Balance on a set of scales a house-plant, first watering the soil well, and covering the pot with a rubber sheet tied tightly around the edges. The plant will project up through an opening in the rubber

sheet. Leave on the scales for a few days. It will be observed that the pot and plant become lighter.

(2) Cover the whole plant of the previous experiment by inverting a glass jar over it. Observe the moisture forming on the glass and on the leaves.

QUESTIONS

1. What material gives the leaf its green color? Show that greenness in a leaf denotes health.
2. Picture five different forms of leaf, naming each. How does the leaf of a rose differ from that of a poplar in shape? Name three leaves with petioles and three without.
3. What are the petiole, midrib, veins? What purposes are served by the veins?
4. What are four different kinds of cells composing a leaf? Describe each. Show this by a drawing.
5. From what two sources do plants take food? What becomes of the food taken in?
6. When plant substance is burned charcoal and ash appear. How were these taken into the plant?
7. What becomes of the soil water taken up by the roots?

D.—THE FLOWER

1. **Its Importance.**—The purpose of the flower is to produce seed by which the plant may reproduce its own kind from year to year. It is probable that all the varied colors, odors, and forms flowers possess are designed to help in making certain that seed will form. Thus the color and odor of flowers exist for the good of the plant, not for the pleasure of man.

2. **Flowering and Flowerless Plants.**—Not all plants produce flowers. Some reproduce by spores instead of seeds and are therefore without flowers. Examples of these are ferns, mushrooms and all fungi, the mosses, liverwort, pond scum, and many others. Among flowering plants there is a great difference in the conspicuousness of the flowers. Usually those with bright-colored flowers and those having odor and nectar, are intended to attract insects so that pollen

may be carried from one to another in order that fertilization may take place and seed thus be formed. Many farm plants have inconspicuous flowers, which many people never notice. Examples of these are wheat, oats, barley, and the various grasses. The flowers of such plants are pollenized and fertilized by the wind.

The flowers of Indian corn are worthy of notice. Those which are produced at the top of the stem in large branched clusters, known as the tassel, will never be followed by seed. In them grows the pollen dust with which fertilization of the seed-bearing flowers takes place. These last are found lower down on the corn-stalk in the axils of the lower leaves. The greenish silk consisting of many long fine threads which appear in July are the pistils. These receive the pollen from neighboring plants by its being carried over by the wind. After that the corn seeds grows large, forming the cob of corn with which we are familiar. The tassels of the corn, and likewise the silk with its related parts, are both flowers in a scientific sense as truly as are the flowers of the lily or rose.

3. **Examination of the Flower of the Sweet Pea.**—If specimens of this flower can not be obtained, the drawings accompanying these lessons will illustrate the chief points to be observed. The most noticeable part of the flower is the corolla, consisting of five petals (the lower two are joined into one known as the keel). The bright coloring of the petals serves to attract insects which will carry the pollen from flower to flower. Outside of the petals is the calyx, a Greek word which means "cup". In this case the calyx consists of five sepals growing together in the cup-like form. The calyx is greenish in color, like a leaf. These are known as the **floral envelopes.**

Enclosed by these in the heart of the flower are the stamens and pistils. There are here ten stamens in all, surrounding a single pistil. These are called the **essential organs** of the flower. No flower can do without them, although they may be in separate flowers, as in the case of the corn and the catkins of the willow.

Stamens produce pollen which fertilizes the pistil. The pistil produces the seed. In the case of the sweet pea the pistil becomes a pod with several seeds enclosed in it in a row.

The number of parts of flowers, as well as the form of the parts varies with different kinds of plant. In all, however, the principle is the same, namely, there are floral envelopes to protect the essential organs within. The stamens produce pollen. The pistils produce the seed after the transfer of pollen to it.

4. **Cross Pollination and Close Pollination.**—We have noticed the work of bees and of the wind in transferring pollen from flower to flower. Cross-pollination in this way helps in producing vigorous plants, and there seems to be a provision in nature that mixing of strains shall take place as much as possible. The heads of wheat, oats, rye, barley, and the grasses bear flowers as we have already stated. It is evident from the lack of color and odor that they are not intended to be pollenized by bees. In most cases the heads are probably self-pollinated or close-pollinated, although the wind may

effect cross-pollination to some extent. In some cases pollen must be artificially transferred if fruit is to come. This would be the case with flowers grown indoors such as the Jerusalem Cherry, or plants grown in hotbeds such as cucumbers and tomatoes.

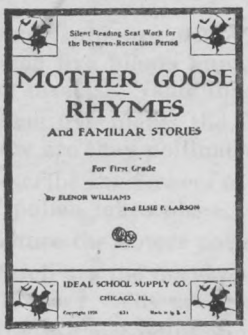
QUESTIONS

1. What is the use of the flower to the plant?
2. Name five plants known to you which have devices for attracting insects. Name three such devices.
3. Name five plants the flowers of which are not readily noticed. How are they pollinated?
4. Describe the flowers of Indian corn and explain how interchange of pollen takes place.
5. Picture the flower parts of the sweet pea. Describe these briefly.
6. Which are the floral envelopes, and which the essential organs of a flower? Why are they so named?
7. Why is cross-pollination of plants desirable? Name three means by which it may be done. Why is alfalfa seed hard to grow but wheat or oats always form in the heads?

NOTES

Silent Reading Seat Work

MOTHER GOOSE RHYMES AND FAMILIAR STORIES



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